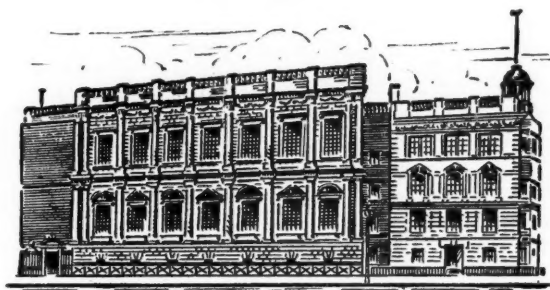


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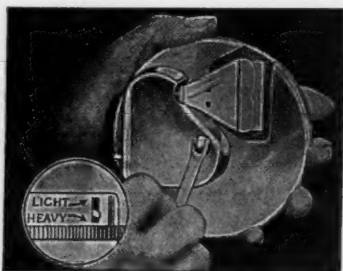


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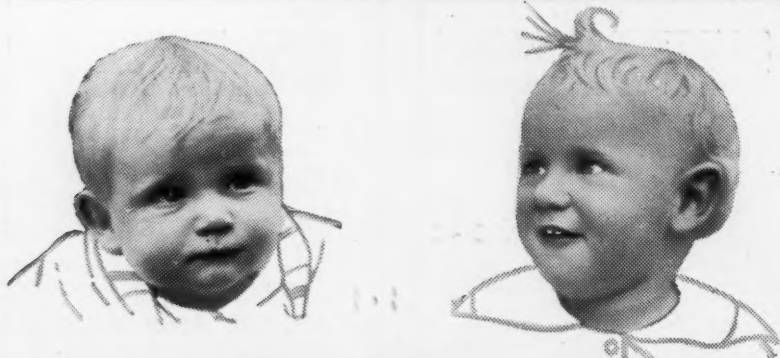
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Acceptances and Endorsements, &c., for account of Customers			24,874,316	17	5	Balances with other British Banks and Cheques in course of collection ..		
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Commissioned Officers of *all* H.M. fighting Services, including those of the Dominions, Colonies and India, and Midshipmen of the Royal Navy, Royal Naval Reserve and Royal Naval Volunteer Reserve, are eligible for membership without proposal or ballot.

Naval, Military and Air Force Cadets are eligible on the recommendation of their Commanding Officers.

An Officers' Mess may subscribe to the JOURNAL, but is *not* eligible for membership.

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(a) £20 os. od., payable in one sum or:

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It is important that Officers joining should furnish full and clear particulars of their Name, Rank, Ship, Regiment or R.A.F. Squadron, etc., and the address to which they wish their JOURNALS sent.

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THE INSTITUTION.

The Royal United Service Institution is situated just below the War Office in Whitehall. It has the best professional Library in the United Kingdom; a Lecture Theatre where an autumn and winter session of lectures is devoted to subjects of current or historical Service interest. The Reading and Smoking Rooms are provided with the leading papers, periodicals and writing materials.

The Institution is open daily from 10 a.m. to 7 p.m., except Sunday, Christmas Day and Good Friday.

THE JOURNAL.

The R.U.S.I. JOURNAL is published quarterly and sent post free to Members in any part of the world.

THE MUSEUM.

Situated in the Banqueting Hall of the old Palace of Whitehall (1622), with its magnificent Rubens ceiling, the R.U.S.I. Museum is a treasure house of relics and mementoes of great victories and renowned warriors. There is also a most valuable collection of Uniforms, Medals, Ship Models, and models of the battles of Trafalgar and Waterloo.

For Members and their friends, there are private entrances to the Museum from the Institution.

H.M. Forces in uniform are admitted free at the public entrance.

Admission to the general public is 1s.; Saturday after Noon, 6d.

SECRETARY'S NOTES

February, 1929.

Anniversary Meeting.

The Anniversary Meeting will be held on Tuesday, 5th March, at 3.30 p.m. The Council will present their Annual Report and Accounts, and the election to vacancies on the Council will take place. The Chesney Gold Medals for the years 1926 and 1927 will be presented.

The Chair will be taken by the Chairman of the Council, Field-Marshal the Viscount Allenby, G.C.B., C.C.M.G., D.C.L., LL.D.

Council.

The following members of the Council, having completed three years' service, retire at the Anniversary Meeting :—

Captain the Earl Howe, C.B.E., V.D., M.P., R.N.V.R.

General Sir J. A. L. Haldane, G.C.M.G., K.C.B., D.S.O.

Colonel A. S. Bates, D.S.O., T.D.

The vacancies will be filled at that Meeting in accordance with Chapter 3 of the Bye Laws.

Major-General W. H. Bartholomew, C.B., C.M.G., D.S.O., succeeds Vice-Admiral Sir Herbert Richmond, K.C.B., as an *ex-officio* member of the Council on taking over the appointment of Commandant of the Imperial Defence College.

New Members.

The following Officers joined the Institution during the months of November, December and January :—

ROYAL NAVY.

Lieutenant G. F. Agutter, R.N.

Lieutenant B. G. Scurfield, R.N.

Lieutenant S. G. Long, R.N.

Lieutenant J. L. Moulton, R.M.

Lieutenant-Commander A. E. H. Cameron, R.N.

Commander A. J. Power, R.N.

Captain C. E. Kennedy-Purvis, R.N.

ARMY.

Lieutenant R. Deedes, King's Shropshire Light Infantry.
 2nd Lieutenant W. P. N. L. Ditmas, Royal Tank Corps.
 Captain C. J. T. Dean, late R.A.
 Captain W. E. Molesworth, M.C., Royal Tank Corps.
 Major R. V. C. M. Young, T.D., R.A.S.C. (T.A.)
 Lieutenant M. D. Erskine, Scots Guards.
 Captain B. J. Haworth, R.A.S.C.
 Captain J. R. P. Finlay, 3/10th Baluchistan Regt.
 Major H. Hobbs, R.G.A.
 Captain J. C. Ledward, Inns of Court O.T.C.
 Lieutenant C. H. Lyddon, Royal Signals.
 Captain F. L. Stroud, Royal Engineers.
 Captain E. V. F. MacSwiney, Royal Signals.
 Major M. W. Baugh, I.A. (retired).
 Lieutenant W. T. Lindesay, Scots Guards.
 Major J. M. Brickman, 3/20th Burma Rifles.
 Lieutenant Basil Carey, Royal Tank Corps.
 Lieutenant J. G. E. Hickson, 1st Battalion, The Loyal Regiment.
 Lieutenant-Colonel R. J. Bentinck, I.A. (retired).
 Major I. Simson, Royal Engineers.
 Lieutenant R. F. Ware, M.C., Durham Light Infantry.
 Captain H. F. Pipe-Wolferstan, R.E.
 Captain J. G. E. Tiarks, King's Dragoon Guards.
 Captain R. A. Coates, London Scottish.
 Captain H. W. D. Palmer, 16th Punjab Regt.

ROYAL AIR FORCE.

*
 Flight Lieutenant A. H. H. MacDonald, R.A.F.
 Flight Lieutenant C. R. Davidson, M.C., R.A.F.
 Captain D. E. Williams, M.B.E., M.A.
 Flight Lieutenant W. M. M. Hurley, R.A.F.
 Wing Commander W. S. Douglas, M.C., D.F.C., R.A.F.
 Wing Commander W. B. Callaway, A.F.C., R.A.F.

CIVIL.

R. F. Franklin, O.B.E.

Gold Medal Essays, 1928.

The following Essays have been received and duly adjudicated upon by the Referees. The result will be announced at the forthcoming Annual General Meeting :—

- "Let the Sword be sharpened with Wisdom."
- "Principles not Precedents."
- "Plus ça change, plus c'est la même chose."
- "Spero Meliora."
- "Fairly Alongside."

ADDITIONAL STANDING ORDERS.

The Council have approved the following additional Standing Orders :—

CHAPTER VI.

REGULATIONS.

LENDING LIBRARY POSTAGE.

1. Members must refund the cost of postage on books sent to them from the Lending Library, either on receipt of or on returning the books.
2. Members in arrears with their postage account will be notified that unless these are paid no further books can be sent to them.
3. Members who are constantly changing books by post are recommended to furnish the Librarian with a small deposit, which he will account for.

MEMBERS' LETTERS.

4. Members may have letters and telegrams addressed to them at the Institution, but the Council accept no responsibility for their custody, and no arrangements can be made for forwarding them.

JOURNAL.

"Ten Years Ago."

The originals of the pictures, "Some Sea Officers of the Great War" and "Some General Officers of the Great War," reproduced in the last number of the JOURNAL, were presented to the Nation by Sir Abe Bailey, Bart., K.C.M.G., J. P., D.L., to whom, therefore, the Institution is indebted, as well as to the National Portrait Gallery.

In the article published under this title, the date of birth of Admiral Sir Walter A. Cowan, K.C.B., M.V.O., D.S.O., should have read 1871.

LIBRARY.

Facilities for Borrowing Books.

The special attention of Members who are now paying the new annual subscription of £1 5s. od., is invited to the fact that they are thereby entitled to the full privileges of the Lending Library without further charge. These include the right to have sent to them not more than four volumes at a time on loan, the Member paying postage both ways.

Old Members who have not wished to conform to the new arrangement and who are still paying the original subscription of £1 1s. od., must pay an additional subscription of 10/- per annum in order to belong to the Lending Library.

All Members are, of course, free to use the Library when they visit the Institution.

Rules Governing Return of Books.

The attention of Members is invited to the following Regulations governing the retention and return of books :—

- (1) Certain books, for which there is a special demand, must not be retained longer than a fortnight after the date of receipt. A notice to this effect will be found in the book.
- (2) In the United Kingdom.—Books must normally be returned within one month of the date of issue ; but the Librarian is authorised to make extensions of one month at a time on application by a Member, up to a maximum of three months from the date of issue, if the work is not required by another Member.
- (3) All Stations Abroad.—Books must not be retained for more than seven months from the date of issue.

Members are specially requested to conform strictly to these regulations, as failure to do so causes much inconvenience to others and involves the Institution in unnecessary expense and clerical labour.

Army Orders Wanted.

The Library of the Royal United Service Institution does not possess copies of Army Orders for the period January to September, 1889, or copies of General Orders for 1885 and 1886. Any Member who is in a position to supply the missing numbers is invited to do so.

MUSEUM.

Policy.

The Council has approved of a policy whereby the exhibits in the Crypt of the Museum shall gradually be modernised with a view to their representing the latest developments of the three fighting Services. It is particularly desired to inaugurate permanent collections of models illustrating :—

- (1) The latest types of British warships.
- (2) The mechanization of the Army.
- (3) The latest types of war aircraft.

It is also desired to bring the collection of artillery models up to date.

Members are invited to co-operate in any way they can to promote this policy.

It is not the intention to change in any way the character of the exhibits in the Banqueting Hall.

Special Exhibitions.

PANORAMA OF ARMADA SHIP MODELS.—This Exhibition was opened just before Christmas and will probably be continued until July. It shows, in a picturesque setting, types of the principal ships of the rival fleets which took part in the battle of the Great Armada.

AIRCRAFT MODELS.—Models of aircraft representing the types in use by the Fleet Air Arm and showing the development of flying boats and seaplanes are now on view in the Crypt.

Additions.

- (7996) The first shell fired into Ladysmith. Stool taken from King Prempeh's Palace, Kumasi, during the Ashanti Expedition. Brass Weights and Scales used for weighing gold, found in Kumasi during the Ashanti Expedition.
- (7997) A Scented Pastille found in King Charles' pocket after his execution.
- (7998) East India Company's Commissions from Ensign to Colonel, of Lieutenant General John Barrett.
- (7999) Grape Shot from the Battlefield of Assaye.
- (8000) Portion of the Flag used to cover the body of the Prince Imperial when bringing it back to camp in 1879.
- (8258) Plaster Statuette of a 9th Lancer, period 1900.
- (8259) Painting in oils of Trumpet Major Gray, 8th Hussars. Trumpet belonging to above, Good Conduct Medal, Crimean Medal (four clasps), French Legion of Honour Medal, Turkish Medal. One pair of Spurs. Certificate of Legion of Honour, 21/6/1856.
- (8260) Trumpet Major Gray's discharge Certificate. Nine Letters written by Lord Cardigan to Trumpet Major Gray.
- (8261) Sabrette, Crossbelt, Helmet Badge, Cap Badge and Buttons of Royal Irish Rifles.
- (8262) Officers' Union Locket, East Kent Militia.
- (8263) Officers' Union Locket, Oxfordshire Light Infantry.
- (8264) Portrait in oils of Sir John Franklin, by William Wallis after J. Phillips, 1854.
- (8265) Blunderbuss—Early 18th Century, with lock plate engraved "G.R. Tower," Barrel 28 ins.
- (8266) Portrait of Tantia Topi, painted by Major General C. R. Baugh, when a Captain, on 18th April, 1859.

Attendance.

The amount taken for the past Quarter was :—

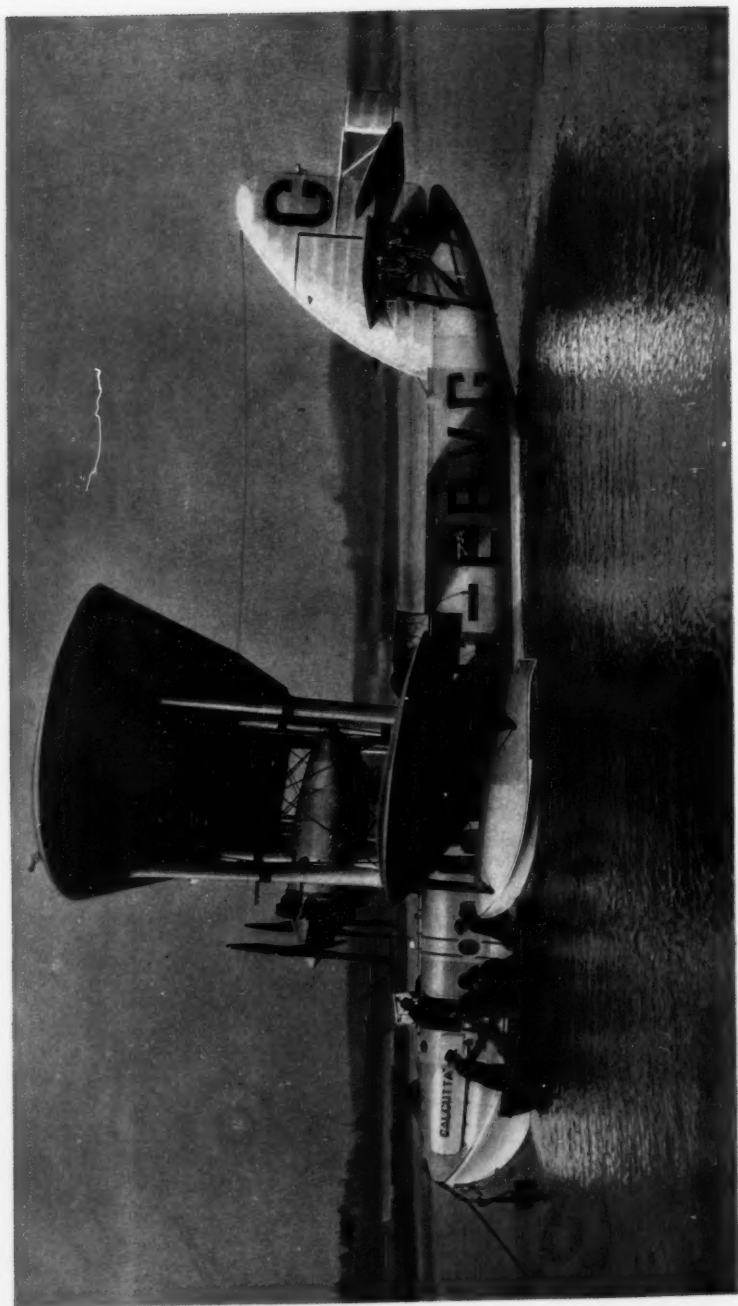
£127 11s. 6d. in November.

£103 5s. od. in December.

£144 14s. od. in January.

Purchase Fund.

This Fund was opened with the object of purchasing suitable exhibits, which from time to time are offered to the Museum, or are put up for sale at various auctions. The Council hope that it will receive support from Members of the Institution who are interested in the Museum.



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All communications (except those for perusal by the Editor only)
should be addressed to the Secretary, Royal United Service Institution.]

**THE PART OF THE RETIRED OFFICER IN THE
FUTURE OF THE EMPIRE**

By ADMIRAL SIR R. G. O. TUPPER, G.B.E., K.C.B., C.V.O.,

On Wednesday, 31st October, 1928, at 3 p.m.

LIEUTENANT-GENERAL SIR GEORGE M. W. MACDONOGH, G.B.E., K.C.B.,
— K.C.M.G., in the Chair.

THE CHAIRMAN said the Lecturer was so well known to the audience that he needed no introduction.

LECTURE.

THE conclusion of the Great War naturally produced a very large number of Retired Officers of the Navy, Army and Air Force. Ten years having elapsed since the cessation of hostilities, it is possible for those Retired Officers to give us the benefit of their opinion and of their experiences, and I hope the fact of this important subject receiving publicity in this Institution, may result in some scheme being inaugurated for the mutual benefit of those Officers and of the Empire.

It may be held that because the Retired Officer has given the best of his abilities, both physical and mental, to the Empire in various capacities and in many different parts of the world, his country, besides giving him a gratuity or a pension on retirement, should support

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organizations which would assist him in the future. On the other hand it may be urged that, since the Naval, Military or Air Force Officer chooses to lead an enjoyable life instead of going into business or into a money-making profession, he is not entitled to any special assistance, and must take his chance of obtaining employment on his retirement.

I hope and think that the majority of my countrymen belong to the first category, and that steps will yet be taken to ensure that the abilities, educational or otherwise, and the very practical qualities developed by Service training are more fully utilized than is at present the case. Inquiries made at the Foreign Office, Dominion and Colonial Office, Admiralty, War Office and Air Ministry, have elicited the information given in Table I. I also asked those Offices to give me some idea of the numbers who retire annually, but they find it very difficult to provide even a rough estimate; still less could they answer the questions: where do they go; where can they go; what are they doing; what prospects have they of getting employment, either at home or abroad?

Now let us see what are the needs of the Empire to-day:

1.—RESETTLEMENT OF POPULATION.

Viewing the Empire as a whole, certain parts, notably the British Isles, and particularly the big towns therein, are over populated, and this congestion is a serious economic problem. Vast spaces overseas, notably in Canada, Australia, New Zealand, and to a less extent South Africa and the Colonies, urgently require a British population for their agricultural and eventual industrial development. Failing British immigration, these spaces must eventually be filled by alien peoples—whereby the cohesion of the Empire would be seriously weakened.

The Retired Officer has special qualifications which should enable him to assist and participate in this problem of resettlement. By virtue of his training, he is used to handling and leading his fellow men. He is not deterred by physical or climatic difficulties. He has enterprise and organizing ability. The one thing he lacks is a business training; yet he is far from being so ignorant of financial matters as is so often imagined. Most officers of the fighting Services have, at one time or another, had financial responsibility. The Captain of a ship, for instance, is ultimately responsible for appreciable sums of money entrusted to his care and for the valuable stores embarked. Moreover, very many officers in this position have had to deal with financial questions quite outside the limitations of their own command. In the Army a Colonel, and even the most junior company officer, has to deal with accounts and stores of various kinds: the same applies to the Air Force.

Apart from general qualifications, officers are trained in the Services to hold their own in the Empire community as a whole, and they can bring to this problem certain valuable specialist knowledge, which does not form part of the education of the ordinary citizen. For instance an officer of the Royal Navy or of the Mercantile Marine understands the handling, berthing, loading, unloading, navigation, manning and up-keep of floating craft of every kind. He has a knowledge of harbours and ports with their equipment, moorings, jetties, and of the effect of weather and sea. The handling of men is engrained in him.

The Army officer is often an expert in land transport, in the organization and maintenance and manning of mechanized vehicles, in sanitation, housing and supplies, and the selection of sites for dwellings or store houses. The marshalling of labour in large or small squads has also come within his experience.

The Air Force officer has acquired many of the attributes of his military colleague, and some of those of the sea service, while he has undergone a specialist training which is certain to find more and more scope, as air communications assume greater importance.

So far the subject has been considered from a general standpoint ; but the members of the fighting Services, although they have many attributes in common, are not all cast from the same mould. The aftermath of war has forced many out of their normal employment, and as the Army and Navy are still reducing officers, a mass of Retired Officers is still being cast into the abyss of the unemployed. Of course a certain percentage may be said to have joined the "unemployables." This community is made up of many different types: there is the officer who is now too old, or too ill in mind or body, to launch out on a new line of life, or ever to resume leadership in any form; there is the officer who has worn himself out in the service of this country, and who thoroughly deserves the rest and peace of his remaining years; but there is also the officer who, through sheer mental inertia, or through the lapse of the influences of discipline and sense of duty fails to respond to the moral calls, which the Empire is, or should be, making on him.

But apart from these "unemployables" there exists a large number of officers only too anxious to do "something," but without either the imagination, or guidance, to concentrate and devote their efforts to anything in particular. These latter may be sub-divided into:—

(1) Retired Officers who by reason of age, infirmities, financial or domestic ties, must remain in the Home Country, but who have a varying amount of leisure to devote to unselfish service.

(2) Those who might, under favourable circumstances, start life anew, or at least shift their habitation overseas, but who must be

4 THE PART OF THE RETIRED OFFICER IN THE FUTURE OF THE EMPIRE

assured of definite employment and reasonable facilities to meet their domestic calls, wherever they go.

(3) Those who are free lances, young enough to feel that the world is still before them.

There are several Associations which exist to help Retired Officers to find employment; amongst these are the Officers Association (British Legion); the Association of Retired Naval Officers; the Overseas League; and numerous Regimental Associations.

But there does not seem to exist any system for vocational training for officers similar to that which has been introduced to help the rank and file of the Services.

2.—THE HOME COUNTRY.

Within the Home Country there is still a large field wherein the Retired Officer may devote the remainder of his life in activity to the good of himself and of his country.

SALARIED OCCUPATIONS.—First let us deal with going into business. To the average Service man, looking out for himself and his limited capital in business, unless he has family connections who are willing to take him up, or unless he has true friends who will not let him be swindled, the best advice to be given to him is to keep clear of those so-called business men, who put flowery advertisements in newspapers, or who are anxious to recommend some "get rich quick" stocks or shares on first or early acquaintance. It is true that some Retired Officers I know are doing exceedingly well in the City, but a lot have fallen victims to the City shark. Others, after fruitless search for business employment, have given it up. Most City men who advertise want—not the Retired Officer, but his money.

Business houses, as a rule, make a practice of securing workers as young as possible, and training them from the lowest rung of the ladder. A clerk losing his post in mid-life has generally great difficulty in obtaining a fresh job, notwithstanding his qualifications. Therefore, it must be harder for a man with less business qualifications to get a billet in business, and still harder for a man who has been accustomed to command, to start again at the lowest rung of the ladder. A business man I know considers that, owing to their education and travels, naval officers are more likely to succeed in business than their brother officers in the sister Services. He suggests that it would be very useful to add typewriting, and keeping of accounts to the Dartmouth curriculum, and to encourage young naval officers to observe closely business conditions in foreign parts.

TABLE I.

APPROXIMATE NUMBER OF RETIRED OFFICERS EMPLOYED UNDER THE GOVERNMENT.

Department.	No. of Officers.	Remarks.
Dominion and Colonial Office	25 ¹	Governors and Administrators of Dominion and Crown Colonies.
	50	Occasional vacancies for Police, Port Officers and Harbour Masters for which naval and military Retired Officers are considered.
Foreign Office ..	20	Mostly unsalaried Consular Officers.
Admiralty	60	Various positions both inside the Admiralty and connected with private firms in the Provinces.
War Office	36	In the War Office.
	—	Number of Retired Officers employed by the War Office in the United Kingdom cannot be determined without research.
Air Ministry ..	30	Retired Officers filling posts at the Air Ministry and its outstations.
Home Office ..	52	Chief Officers of Police in England and Wales, at present holding Service rank. (Boroughs 14, Counties 38.)
	40	Posts in the Prison Service at present held by ex-Officers—Governor, Deputy Governor and Housemaster.
		There are about 20,000 J.P.'s. in the country, but there are no statistics showing how many are ex-Officers.
Board of Trade ..	75	Coastguard Officers.
		Nautical Surveyors 31
		Examiners of Masters and Mates .. 15
		Nautical Assessors 9
		Port Officers, etc. about 20
India Office	—	Nil.

Note.—To the above might be added such appointments as Captains of Boys' Training Ships and Establishments, such as "Warspite," "Exmouth," "Arethusa," "Worcester," etc., although these are not Government establishments.

It will be seen from Table I. that, compared with the numbers of Retired Officers, there are few salaried positions under the Government available for Retired Officers of the three Services at home.

UNSALARIED OCCUPATIONS.—For those who desire to do good service to the Empire, and who are willing to take up unsalaried occupations, I commend one of the following activities for their consideration:—

¹ Of these, twenty-five Governors and Administrators *only one* is a Naval Officer. The Air Force is unrepresented. In the opinion of the Lecturer these desirable appointments might in justice be more evenly distributed in proportion to the number of Senior Officers of the three Services.

(1) Committees of charitable organizations, particularly those of a Service character, such as local branches of the British Legion, Missions to Seamen, Marine Society, etc., etc.—all generally in need of voluntary workers.

(2) Training boys to be useful citizens in the following organizations:—

Boy Scouts	.. ..	who number about	} 1370,000
Sea Scouts	.. ..	" "
Boys' Brigades	.. ..	" "	90,000
Church Lads' Brigades	.. ..	" "	60,000
Cadet Corps	.. ..	" "	} 100,000
Sea Cadet Corps	.. ..	" "
Officers' Training Corps	.. ..	" "

(3) Navy League Lecturers; Naval and Military History Lecturers.

(4) Air League Workers.

(5) Patriotic Associations, to promote high ideals, and a love of country in the youth of Britain, in which may be included the League of Nations; the English Speaking Union; the Victoria League; the Overseas League; Royal Colonial Institute, etc., etc.

(6) Political Workers.

(7) Royal Naval Volunteer Reserve, Territorial Army and Anti-Aircraft organization.

· **SMALL HOLDINGS.**—A good healthy occupation is the cultivation of a small holding in this country, but it is not an easy way to wealth. The man who works his own holding must make up his mind to work hard, and to get dirty. Once the holding is in working order, he will be able to take time off in the slack season, but he must have helpers, so it is evident that the smallholder's wife must be prepared to assist him with the lighter jobs. Directly you pay for labour your profit goes. Good land can be acquired at approximately £50 an acre, but it is not easy to give an idea how much capital is required, since so much depends upon the class of farming proposed. Fruit farming has been successful in at least two cases in my neighbourhood in Hampshire. On the other hand, others have told me it does not pay, and that a dairy farm is the most profitable. Some can make poultry farms pay, but in my neighbourhood two ex-officers have given it up after a really good try, whereas I know poultry farmers who are not ex-officers, who seem to thrive.

In all these cases it seems to depend upon the individual and his tastes, for if his work is not a pleasure to him he is unlikely to make

¹ There are approximately 654,000 Scouts in the Empire.

a living out of agriculture. However it is an undoubted fact that he is doing good to his fellow men, and to his country, by keeping land in cultivation, and producing milk, livestock and fruit. If he can do so, and at the same time make enough money to live in some comfort, he is doing good to the Empire. Before commencing work he should study the particular class of farming he wishes to follow, both practically, and also by reading up the subject, as there is a lot to learn in order to achieve success. There are many good farmers of all descriptions who would be glad to impart knowledge and experience for a small fee. A list of these to be found in each county, prepared by the County Council, would be a help to ex-officers.

3.—GREATER BRITAIN.

As regards Greater Britain, I have not found that any special privileges are granted to induce Retired Officers to settle in any of the Dominions or Colonies, but of course they are welcomed. The following short remarks about various Dominions may be of interest.

CANADA (INCLUDING BRITISH COLUMBIA).

One of the most favourable places for Retired Officers to settle in Canada is the Okanagan Valley, B.C., where various fruits, such as apricots, cherries, peaches, the best paying apples, poultry and dairy produce can be raised by the small farmer at a profit. To purchase an established farm would require a capital of between £1,500 and £2,500. One man can handle about ten acres with family help, and extra for the harvest. Minimum income necessary, £400 to £500 per annum. A farm will probably pay after the owner has gained the necessary experience, say in two or three years. Labour is difficult to get in this country, so are domestic servants.

If raw land is taken up, it takes several years to make it profitable. A twenty-two acre farm when in full fruit-bearing should have a turnover of about twenty thousand dollars, showing a profit of about £800 or £1,000 per annum.

Besides agriculture there are many occupations which might be obtained by Retired Officers in the Dominion, but I must leave the details to experts. In Canada, as elsewhere, no special inducements are held out to Retired Officers to immigrate. Within the last month or so, however, I have read in one of our daily papers, the account of a vast plan to develop the Peace River Valley, B.C., by assisting some 20,000 families to settle there annually. Canada, showing great patriotism and foresight, wants a big British settlement in the West, and is evidently prepared to make a great effort, and expend some capital, to secure it. Big railway schemes are involved to open up

30,000,000 acres of fertile wheat land, hitherto unworkable, because far from any railway or transport. Such a scheme merits a whole-hearted response, and I trust special inducements may be held out to Retired Officers to go there.

AUSTRALIA.

When I last visited Australia, many years ago, it was possible to purchase land for a small holding for about £6 an acre, so that there was a good prospect of a fairly quick return, and of the possibility of adding more land to the original holding. But I understand that, excepting in the West and North West, land has fallen into the hands of speculators with the result that the price has risen above that at which a small holder can hope to make profit. Nevertheless, I hear that a married couple can get a bungalow in the suburbs of Sydney for about £1,600, and can live there in comfort and enjoy sport for £400 per annum.

I hope I may hear to-day how the Retired Officer with about £400 a year can make a comfortable livelihood in any part of Australia or Tasmania.

NEW ZEALAND.

Of all the Dominions I have visited New Zealand struck me as being the most attractive. I hear that to-day a Retired Officer can live comfortably and enjoy sport of a varied character in that country on an income not exceeding £500 a year. No special privileges are granted to Retired Officers to induce them to settle in New Zealand, but a warm welcome, I know, awaits any who make up their minds to go there.

SOUTH AFRICA.

South Africa may generally be called the place for elderly settlers as native labour is plentiful, also the domestic servant problem is easier for their wives. The Government helps settlers by advancing money under the Land Act up to about four-fifths of its value. There are also five Government schools situated at Elsenberg, Groosfontein, Glen, Cedara and Potschefstroom, in which intending settlers can learn all about the work of their choice. These schools take unmarried settlers at an inclusive cost of £60 per annum as resident students. Married students live in the adjoining township so that the approximate cost of living for them would be £400 per annum. It is absolutely necessary for intending settlers to go to one of these schools for two years before purchasing land. When experience and knowledge have been gained, the would-be settler will need about £3,000 capital to establish a fruit farm—£2,000 for the farm and house, and another £1,000 to cover fencing, labour, plough and other implements, horses, etc. In addition,

he must be able to contemplate living on his private income for three years before he can hope for an income from his farm.

KENYA.

The climate is the great attraction of Kenya, but the height—8,000 feet above the sea—makes it advisable, especially for women, to return to England or a similar climate every three years. Some people consider that a capital of £2,000 is sufficient to buy a farm, build a house, and exist in comfort; others consider this to be a bare minimum. Farms generally require two or three years before any return can be derived, so that unless a man and his wife enjoy an income of £400-£500 per annum to tide over these first two or three years, the prospect of even moderate success is doubtful. With such an income, it is quite possible to live in comfort, and when the farm is paying, a visit to Europe should be possible. It is said that sisal is the best and most paying crop, but of course fruit, wheat and cattle also do well.

NORTHERN RHODESIA.

An officer formerly on my staff left the Service, and set up a tobacco farm near Fort Jameson where other naval officers have also settled. At first he had to live in a mud hut until his own house was built of bricks (he superintended the building of it himself). He succeeded very well, having paid for his land and his house with his first two or three crops; but just at present he is complaining bitterly, as there has been an over-production of tobacco so that he and his colleagues find themselves unable to sell their stock. He says "it is a very serious state of affairs—but I can't help thinking it is only a 'stunt' of some sort between manufacturers and brokers, and will right itself before long. In the meantime a lot of planters are very apt to have to close down, which seems a pity." One knows that "stunts" of this kind are continually taking place in the business world. The producer is successful; his farm becomes fertile; the article he produces becomes so plentiful that its price to the buyer may be reduced. This does not suit the broker or middleman; so the surplus stuff must be scrapped; the price must remain high; and the producer, who has worked hard, cannot sell his produce, so that, unless he has considerable private means, he has to "close down." This is one of the clogs on the wheels of Empire production, which calls for effective treatment, perhaps by legislation.

4.—DEFENCE.

Having considered how Retired Officers can benefit themselves and, at the same time, help to increase the fertility and prosperity of the Empire, let me conclude with a few remarks on how their technical knowledge and experience can be utilized for the defence of the Empire.

Everyone is agreed that to seek peace and to ensure it is the right way to enable our trade and industries to flourish. The vast majority agree, too, that the League of Nations is a great help to attaining that ideal, but somehow that story of Naboth's vineyard continues to be enacted at odd times and in unexpected places. This produces War abroad and Emergency at home. In making agreements for the reduction of armaments we have reserved to ourselves the right to resist by force unprovoked interference with our rights and property. Our American cousins seem also to be most emphatic in asserting the principle of self-defence, and of the Monroe Doctrine. Surely the best way to guard against such interference is to be so well prepared to resist it that no one will be inclined to indulge in it.

As it seems probable that our Fighting Services' personnel will be still further reduced, although many consider that it has already reached its lowest possible limit for safety, surely it is all the more necessary to utilize the services of Retired Officers to the full. In order to do so they must not only be encouraged to keep bright the knowledge they have already acquired, but also to keep abreast of the changing conditions governing modern warfare.

Having regard to the rapid strides being made in aerial navigation, and the wonderful performances of the latest flying boats, surely we may soon expect to find mails and passengers conveyed almost exclusively by air to and from our coasts and those of the overseas Dominions and Colonies. We already possess an invaluable chain of coaling stations; most of these could be readily adapted for fuelling flying boats. For defence purposes it may be found necessary to have a reserve of fighter aeroplanes at each of such stations. Who better than Retired Officers and pensioner personnel, to form the ground or shore staff for a commercial service in peace which could immediately expand into an air defence force in the event of war.

Airships, of course, also come into this picture. Although not yet so fully developed as flying boats, it seems probable that the same arguments as regards the personnel for their mooring and fuelling stations will apply in the near future.

In fact let us consider the sea as our aerodrome.

Next we come to our all-important Merchant Navy. Possibly, as I have said, the flying boat and airship may, in course of time, supersede the great steamship for carrying mails and passengers, but the millions of tons of foodstuffs, merchandise, etc., must continue to be carried to and from Great and Greater Britain in surface ships. I have already alluded to air force defensive measures at certain focal points but, of course, this is not a substitute for naval defence. The Royal

Navy personnel retained on the Active List seems to be dwindling dangerously ; therefore we must look to the Retired Officers of the Royal Navy, and Merchant Navy, to enable us quickly to expand our peace Navy into a war Navy. This will involve converting and manning merchant vessels for use as cruisers ; it will also necessitate our naval reserves keeping *au fait* with mine-sweeping, anti-submarine and anti-aircraft work.

At the end of the War I happened to be Chairman of a Committee for re-organizing our Merchant Navy. The report was never published, but one of the suggestions was that, periodically, Royal Navy Officers and Merchant Navy Officers should interchange ships, so that mutual understanding of each other, and each other's ships and duties, should result. Many cargo ships are under-officered, I believe the regulations only require two deck officers besides the Master. It seems to me that a third officer, Retired R.N. or R.N.R., with wages paid by the Admiralty and food and lodging provided by the Company, would be a useful asset, because in addition to assisting in the general work of the ship, he would be able to impart instruction in duties which the crew of every merchant ship is called upon to perform in war, and thus keep himself efficient also.

Respecting the Army, some of our Dominions have conscription, every able-bodied man being obliged to qualify for defending his country if called upon. At Home our Territorial Forces are capable of rapid expansion. Soldiers can be trained more quickly than sailors or airmen. Our permanent land forces being now reduced to a minimum, if the call comes to defend the Empire, thousands of trained officers would be the first and most urgent requirement.

Inquiries at various Government Offices of all kinds, have led me to the conclusion that no special machinery exists for promptly making use of the services of Retired Officers, although, I submit, concurrently with the reduction of permanent armed forces of all kinds there should be complete readiness of the Reserves. I should like to see the Admiralty, War Office, and Air Ministry in possession of organizations to keep close touch with Retired Officers throughout the Empire, and to encourage them to keep up their technical knowledge ; also on retirement every officer should be given instructions telling him what to do, and where to go if the call comes. Dominion Governments should do the same with Retired Officers who have settled overseas. Money should be available to enable Retired Officers to attend occasional short courses of instruction . Probably it would be sufficient to pay their travelling and subsistence expenses, and well worth the cost.

In France Retired Officers are, to my knowledge, kept in touch with their Services, and occasionally attend courses and manœuvres.

Being a Sea Scout, I suggest Retired Officers should adopt our motto and "*be prepared*"

- To produce something ;
- To train boys as good citizens ;
- To keep efficient as officers.

The Retired Officer has had a life-time's training, the keynote of which has been service to, and pride in, King and Country. It is the carrying forward of these great traditions and their promotion and advancement amongst the civil community which, whatever else his circumstances may enable him to do, should be his lasting mission to the day of his death.

DISCUSSION.

(The Editor regrets that owing to pressure on space the instructive remarks made by the several participants in the discussion have had to be summarized.)

FARMING.

VICE-ADMIRAL W. HENDERSON gave his views based on his own practical experience of farming. He emphasized that although a retired officer might be able to live by farming with a private income of £400-£500 per annum, success must depend very largely on his wife, who might not be able to stand the roughness of the life, especially in the Dominions or Colonies. Small holdings he considered to be a futile enterprise for the retired officer. Generally speaking he is psychologically unsuited to the life ; it is very expensive to start ; entails extremely hard work. With few exceptions, the small holding is not a success in this country.

The large farm involves an outlay of capital which the retired officer is not likely to possess. Dr. Ruston, of Leeds University, has calculated that the successful farm is one of 200 to 300 acres and that small holdings of 50 to 100 acres and the large farm of 500 acres and above are money losing concerns. For a 200 acre farm a man requires £2,500 capital and on that he will not make much more than a labourer's wage. If he has to employ outside labour, his profits are proportionately reduced.

An officer in the Services has to work, to a great extent, with his head ; if he starts farming, without a sufficiency of capital, he is liable to find himself committed to do such hard physical work that he will break down.

It comes to this, therefore ; a retired officer, to farm successfully, must go where economic labour is obtainable and where there will be scope for his great faculty for handling men. He must also choose a place where the climatic conditions are suitable for the white settler, his wife and children. Such places are South Africa, the highlands of Southern Rhodesia and certain parts of Kenya. Even there he requires £3,000 to start with ; then he may succeed.

THE BOY SCOUT MOVEMENT.

SIR ALFRED PICKFORD appealed to retired officers to support and work for the Boy Scout Movement. He said that there are practically no salaried appointments, so that it was a matter for voluntary service. He remarked that it is most difficult to find the right sort of helpers. There are 241,000 Scouts scattered over

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every part of the Empire; therefore the movement has a distinctly Imperial aspect. In 1927, 930 Scouts emigrated; there was but one failure.

The Scout Movement is essentially one for character training and the more we can get the Imperial idea, founded on British characteristics, instilled into our boys, the better it will be for Imperial ties in the future.

The Boy Scout Movement depends entirely on individual training. Mass training is completely divorced from its whole conception; that means the number of boys in each particular troop must be limited roughly to 32. The result is that the extent of the Movement is practically conditional on the number of men who will come forward and help, either on Committees, as Commissioners, or as Scout Masters. There is scope for men of every age and in every state of health for this work.

Admiral Tupper had remarked that the present efforts towards peace may throw more and more officers out of employment. But there is another aspect of the question. Surely it will become all the more necessary to keep alive the spirit of adventure which belongs to the British race. This can be done by movements of the Boy Scout nature.

The movement also provides something in the nature of a substitute for that lack of parental control which is so much deplored to-day. It is estimated that only one boy out of every five in this country is attached to any organization at all; in other words, four out of five boys are in danger of going wild.

Information concerning the Boy Scout Movement can be obtained on application at Imperial Headquarters, 25, Buckingham Palace Road, S.W.1.

OFFICERS BENEVOLENT DEPARTMENT OF THE BRITISH LEGION.

MAJOR-GENERAL SIR F. MAURICE described the work done by the above organization started by Earl Haig in 1920. One of its first objects was to warn the retired officer against the City "shark." This was done by the formation of a Free Legal Advice Bureau. This office since its inception has taken up over 3,000 cases and has recovered a great deal of money for retired officers.

Another branch deals with loans to officers without capital. The organization is run by voluntary workers—business men mostly from the City of London—and in eight years £510,000 has been lent, free of interest, of which £275,000 has already been repaid. In making these loans preference is given to disabled officers.

Yet another branch deals with men possessing no capital and not eligible for a loan. This task was being done until three years ago by the Ministry of Labour, when it was handed to the Legion.

Work is now being found for about 800 cases a year at salaries from £3 per week to, in one case, an income of £1,500 per annum.

For several years eminent lawyers and business men have given their advice free, but this organization was built up to meet war conditions and must in due course necessarily disappear. In the opinion of the speaker it was urgent that an organization on the same lines should be established on a permanent basis, since the appeals for assistance from those retiring in a normal way continue to be numerous, while the existing organization is limited to helping those whose necessities arose through the Great War.

THE NAVY LEAGUE.

COMMANDER H. M. DENNY, R.N. (Secretary to the Navy League), wished to draw attention to the openings for retired officers to earn fees by lecturing. The Navy League controls such an organization. There is a great demand for

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these lectures in schools and colleges. Many of the lecturers who now go there do not understand the Services. The lecture season lasts about five months.

OVERSEAS LEAGUE MIGRATION BUREAU.

MR. CYRIL BAVIN (Honorary Secretary, Overseas League Migration Bureau) : The Overseas League specializes in helping those desirous of settling in the Empire outside Britain. The League now has 600 secretaries in various parts of the Empire ; it started after the War for the purpose of advising men of the type of the retired officer who wished to seek their fortunes overseas. Many instances had arisen where, through lack of such advice, such men had gone out and lost all their capital, and come back disgruntled by their experience.

The League has set up Advisory Committees in those parts of the Empire which most appeal to retired officers, such as British Columbia, the Maritime Provinces, New Zealand, Tasmania and the East African Protectorates. The Committees consist of "groups," usually of twelve men. These collect information and compile careful and perfectly truthful accounts of their district (social, educational and sporting facilities, etc.) for the benefit of would-be settlers. Similar reports are drafted by women from the same districts for the use of officers' wives.

A Central Committee sits in London : this includes representatives of the Admiralty, War Office, Air Ministry and Association of Retired Naval Officers. In the past six months circulars have been sent to 15,643 officers : of these 99 have decided to venture abroad. Letters show how valuable have been the services these men have received on arrival. Information concerning the League is supplied on application to the Bureau of the League at 4, Park Place, St. James's Street, S.W.1.

AN IMPERIAL ARMY.

COLONEL A. H. VAN STRAUBENZEE believed that a total reorganization of the armed forces of the Empire was required. He wished a Royal Commission appointed to study the question. He advocated some form of compulsory militia service. All young men should go through an eight months' training once between the ages of eighteen and twenty-three. All infantry should be converted into pioneers ; in peace they would work at agriculture and on roads. Officers should be guaranteed employment up to sixty years of age. They would do a four years' course of training, the last year being devoted to agriculture.

Emigration would be controlled by the Army. Brigades would be centred where they could look after men placed on the land in various parts of the Empire.

THE MERCHANT SERVICE.

CAPTAIN SELWYN DAY (Royal Naval Reserve) wished to support the lecturer's scheme for the interchange of officers of the Royal Navy with officers of the Merchant Service. The armament which it seems probable may be placed in a merchant ship on the outbreak of war is such that the interchange of officers is necessary for instructional purposes alone if that armament is to be employed to any effect. Herein lies scope for the services of the retired naval officer.

THE ASSOCIATION OF RETIRED NAVAL OFFICERS.

VICE-ADMIRAL F. W. CAULFIELD (President of the Association of Retired Naval Officers) drew attention to the fact that this organization was inaugurated on Trafalgar Day, 1925, and three years later it comprised exactly 1,805 members.

It had struck him that after the Napoleonic Wars hundreds of officers had been "axed." Numbers of these settled in Canada and British Columbia. Their descendants had flocked to the Colours in 1914. The lesson was obvious.

He also wished to draw attention to the openings in literature for retired officers.

THE LECTURER.

As the time is rather late, instead of replying to critics myself, I should like to invite our Chairman to make his remarks, which I know will be interesting and include replies to those who have so ably taken part in discussing this important question.

THE CHAIRMAN.

SIR GEORGE MACDONOGH, summing up the lecture, said that at one time he felt that the discussion was taking a somewhat pessimistic line; but that impression had been removed by Sir Frederick Maurice and Mr. Bavin, who had shown that a great deal is being done for the retired officer.

"Who is the retired officer?" he asked. It seemed to him that taking things all round the boy starting on a naval, military or air force career enjoyed better prospects than the lad entering a civil profession, while he had a far more interesting life in prospect. Financially, the officer was probably no worse off than the civilian. A number of undergraduates at Cambridge, after discussing the matter, had come to the conclusion that a man making £1,000 per annum could regard himself as "a success." He held that there were as many chances of making £1,000 per annum in the Services as outside them, besides which there is assurance of a pension.

Two aspects of the officer's case might be improved. Firstly as regards the age of retirement: the average officer is less concerned with rapid promotion than with a career which will carry him well on through life. Secondly, the present pension is nothing more nor less than an annuity; it dies with the recipient. If a lump sum could be given him on retirement, it might be made to provide for a man's surviving family.

Retired officers might be divided into three categories:—

- (a) Those retiring as Admirals or Generals. These are fairly well on in age and have reasonable pensions.
- (b) The man who leaves the Service when still quite young and is not really a retired officer in the sense of that term.
- (c) The true retired officer who has still enough youth to go to the Dominions or Colonies and start afresh.

But, in addition, there is the real problem of the man of fifty years of age who is too old to go overseas. For that he could suggest no solution.

Personal experience in the City showed him how difficult it was to place men of even middle age. He was strongly averse to men parting with any capital they may possess without most careful consideration.

There exists no dearth of unsalaried employment for retired officers. One type of this work, hitherto unmentioned, is local government, that is, County Councils, Urban and Rural District Councils and the like. Officers could do excellent work on these.

He did not blame the Dominions for not attracting more retired officers to settle there, since they required either men possessing capital or men able to do manual work.

As regards "business stunts" he thought the lecturer a little hard on commercial firms. Projects like Rhodesian tobacco were governed purely by questions of supply and demand. Rhodesian tobacco is being strongly pushed and supported by preferential tariff.

As regards service in the event of war, the War Office, at any rate, keeps in touch with officers of the Reserve and each one of them has a prospective mobilization billet. Officers not on the Reserve can always be traced and recalled in emergency.

There remained the question of officers keeping themselves up to date. The first thing to do was to join the Royal United Service Institution; after that the best way of keeping in touch with the Army was an introduction to any neighbouring unit, depot or station.

The customary votes of thanks to the Lecturer and to the Chairman, which were carried by acclamation, brought the proceedings to a close.

MECHANIZED WARFARE IN ASIA

By MAJOR L. V. STEWART BLACKER, O.B.E., p.s.c.,
Q.V.O. Corps of Guides.

I.—*Mechanization in General.*—From 1914 to 1918 a vast host of men were deployed on a relatively small front. Mobility was so low that progress was measured in hundreds of yards. But this began to change by 1919, when the Allies were spread out, on a front of thousands of miles, from the Arctic to the Baltic, to the Adriatic, thence to the Black Sea and to the Caspian; finally through Baikal to the Pacific. If, then, it be true that the next war begins where the last left off, we may expect plenty of elbow room and consequently much movement in any future campaign.

In the past the weapons that proved most formidable in war have been "Distances" and "Man Power"; lately there has been introduced "Propaganda." "Distances" made even the slow moving Russian colossus virtually invulnerable both to Charles XIIth and to Napoleon; but to-day the new weapon of mechanical mobility may change all that. Further, the great increase of fire power ensuing on mechanization can, it is to be hoped, be relied upon to counterbalance huge man-power. Future armies should, therefore, be able to march eight times as far in the day as those of the Swedes or of the First French Empire, whilst their fire power should relatively be quite four times superior (per head) to that of the Russians of a century or two ago. The propaganda weapon is offensive only, whilst recent experience shows that the best antidote thereto is a physical shock applied to the body politic, while in any case a long service, mechanized, army of picked men should be immune to subversive infiltration. In short, modern developments must tend to facilitate concentration of a principal strategical force, a mechanized one, in those comparatively level plains where decisive campaigns have always been fought. Modern engineering resources, unknown even in the last century, favour this power of concentration, thereby enhancing the factors of "surprise" and "mobility." It is important, however, to understand this word "concentration" to imply not so much "concentration" of men, but rather of machines, and again of industry behind those machines,

Conversely, in the "unlimited" war which we are discussing there will and must be "strategical detachments" as always before. The localities in which such "detachments" may fight will most certainly contain mountains, forests, swamps, deserts, peninsulas and islands of the sea. In some parts there may be essential interests to defend; in others, a small force may be required to act in order to divert greater enemy forces. Here, since mechanized forces are unsuitable for campaigning in such areas, there will be required fighting personnel who, by their special characteristics and intelligence, may prove themselves capable of containing an enemy, far more numerous but deficient in such men. To achieve this purpose there will be needed specialized units and formations as yet almost non-existent. In short, the world divides itself into two portions, the one favouring the compact, swiftly moving, mechanized army of the future, while the other will require equally compact specialized and well equipped troops ready to fight in mountain and jungle, on the snow, on the steppes and even in the desert. Royal Marine formations and special air-borne units seem destined to play an effective role in such areas.

In past campaigns, every strategic project was warped by the necessity of gathering together enough men to meet the requirements of the expedition. The Army had to accept every recruit who came forward and then cast him in a general mould in order to produce an average, perhaps a mediocre, type—suitable, it was hoped, for any and every kind of warfare in any environment. Moreover, even the smallest war demanded all available men. To-day this is changing, since mechanization implies that comparatively few men will come under the enemy's fire in the field. The limit of fighting effort will be the ultimate capacity of the country to produce machines and armament. Expansion in man power will probably be barely four fold instead of sixteen fold, as in 1914-1918. The results of this will be seen in several directions. It will be possible to utilize the natural mental and physical qualities of selected recruits for those tasks to which they are best suited; and to utilize units in countries, or over ground, for which their equipment and means of transportation have been particularly designed.

This brings us back to our theory of raising special localised troops, which would comprise:

- (i) Mountain warfare battalions and batteries;
- (ii) Irregular or partisan cavalry;
- (iii) Bush and jungle warfare troops;
- (iv) Royal Marine units, specialised in boat work and landings for covering forces;

(v) Camelry and desert troops ;

(vi) Air-borne units.

The possible objections to this proposal, that it would not be economic to maintain sufficient mountain troops for all mountain warfare requirements; that it would make the "Specialists" parochial in their outlook; and that it would deprive the general run of an army of valuable "small war" experience, may be met by observing certain conditions :—

- (1) All men must be trained to act as "standard infantry" in an emergency, as is now the rule with sailors and airmen, so as to permit of their use for reinforcing other categories.
- (2) Troops should be organised administratively in "depth."

A typical "Administrative Corps" of British regular troops would thus consist of, say, three or four tank units, three or four close support artillery units, some twelve mechanized infantry battalions, three or four companies of reconnaissance troops, two or three battalions of garrison troops (not mobile strategically) together with administrative and workshop units, also a cadre of British officers and N.C.O's for service with Asiatic or African (i.e., bush or desert) troops.

Correspondingly, a regular Indian Army "Administrative Corps" of mountain warfare troops would comprise: two or three batteries of mountain artillery, one regiment of cavalry, two or three mechanized battalions for regular warfare, eight or ten mountain or forest warfare battalions, two or three garrison battalions.

Lastly, if the Administrative Corps be one for "regular" warfare, it would include: one brigade of "light" artillery, mechanized, eight or ten mechanized infantry battalions, two or three close reconnaissance units, four or five garrison battalions.

The outstanding advantage of this proposal, which may be termed "administrative organization in depth" is that each battalion will consist of experts in that particular kind of fighting for which it is intended. If necessary, a battalion might be expanded by taking drafts from other battalions of its own regiment, as well as from Territorial and training battalions. It eliminates the restrictions imposed by the Cardwell system and enables troops to be stationed where they are wanted. Further, the large "groups" again permit of a considerable administrative "decentralization." Finally, the youngest and most active men can be employed for young men's jobs, e.g., as bayonet men, whilst the more experienced become machine or light gunners, scouts, tank gunners and drivers, finally being posted as veterans in the garrison battalions.

II.—*Mechanization on Asiatic Plains.*—There are essential differences

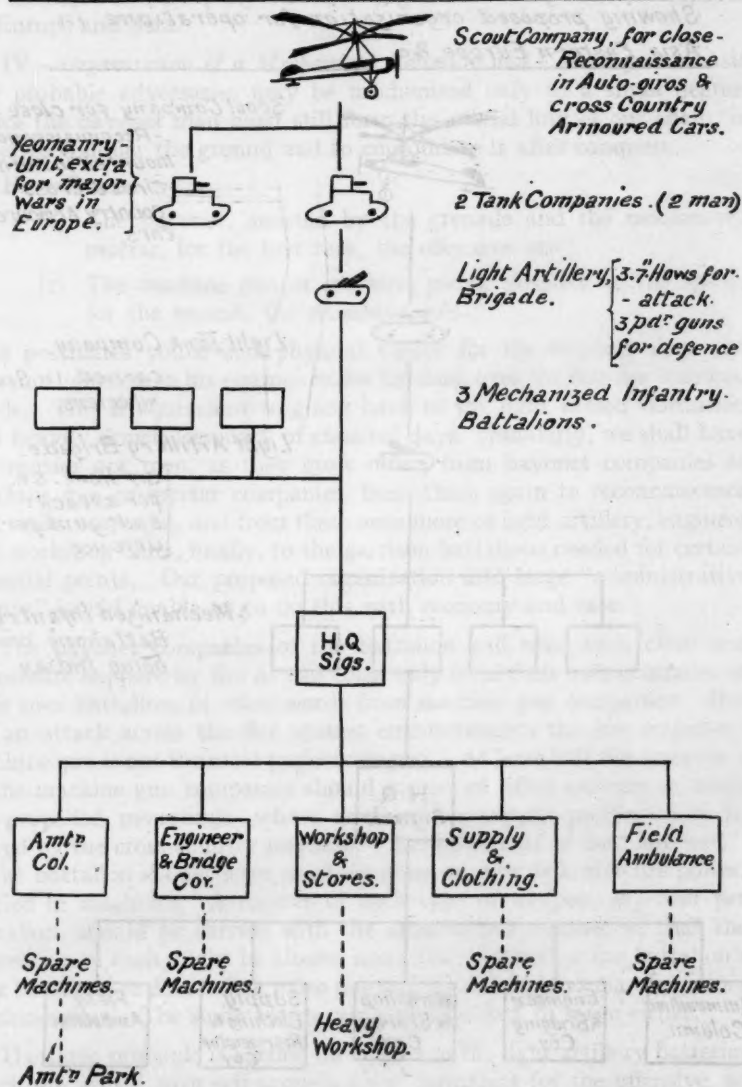
in the problems of organizing and equipping mechanized forces in Europe or in Asia. In Asia we must envisage a need for greater mobility in the widest sense. Mobility is only to be had at the expense of armour protection. The Frankish Knight went to the Crusades heavily armed and mounted on a shire horse. The military honours of those wars remained with the Saracen, with his shirt of mail, his blade of Damascus steel, and his light boned horse, which the Crusader copied too late. In Asia and in Eastern Europe one needs more mobility on account of the greater distances, less weight of armour on account of the rougher going, and also because there will be less concentration of fire. As Bill Stumps remarked "Simplicate and add more lightness."

In the West we shall probably need two large tank units to three mechanized battalions in our "Fighting Group," in the East one smaller and lighter tank company to four battalions should suffice. In any case, the tanks, and very light tanks at that, will have to be carried on multi-wheel vehicles, otherwise the six-wheelers carrying the infantry would probably meet the enemy many days before the tanks, or such of them whose tracks had survived. The infantry machines will themselves need some protection which might take the form of small portable shields hung over the vital parts, and capable of being detached for use by bayonet men when attacking strong points. The extra tanks for the West could be found by assigning Yeomanry units to regular groups. In Asia, Indian battalions recruited from the plains of the central and south Punjab (where ploughing by tractors can be subsidized on a vast scale) will provide the additional "infantry" proportion (see Diagrams I and II).

III.—*Organization of a Mechanized Force.*—When mechanized, any larger formation than a "brigade-group" may give trouble when forced to pass a bridge or to take to a road. Even in peace time it would be too large to be moved about intact on change of station. Our "fighting groups," whether for Europe or Asia, may therefore best be the mechanized equivalent of a "brigade of all arms," viz.: H.Q. (in Signal machines); three mechanically carried "infantry" battalions (four in Asia); one tank unit of two companies (one in Asia); one reconnaissance company of auto giros supported by cross country armoured cars; one brigade of light artillery with S.P. 3.7" howitzers, or tractor drawn light guns, 3-pdr. (or 6-pdr.) anti-tank; supply, ordnance and transport company; workshop unit. This is the standard composition for regular warfare on the flat. With improvements in signal control and cross-country mobility, the size could doubtless be increased.¹ Normally an

¹ These "fighting groups" would be distinct from any "Independent Armoured Force," composed of fast armoured machines with aircraft and used by the Higher Command for finding and "fixing" the enemy, and distinct again from medium and heavy artillery groups.

Diagram 1

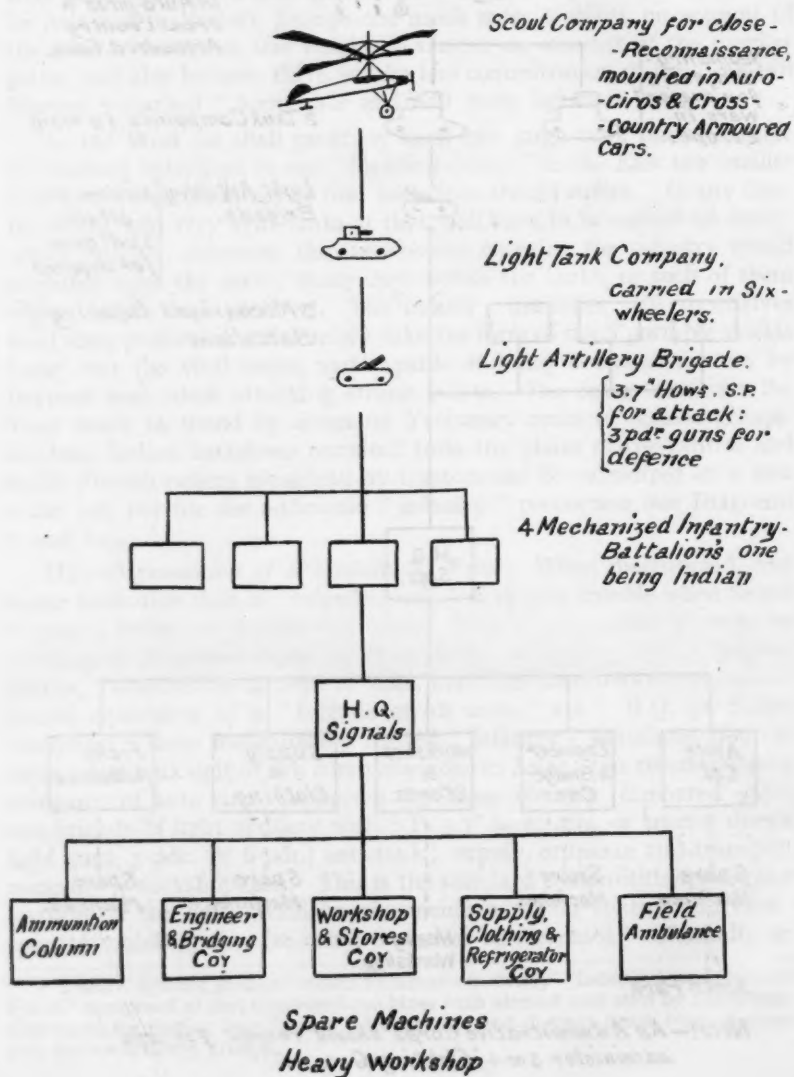
THE FIGHTING GROUP*Showing proposed organization for Europe & similar environments.*

Note:— An "Administrative Corps" should recruit for and administer 3 or 4 "Fighting Groups."

Diagram II

THE FIGHTING GROUP

Showing proposed organization for operations in Asia, Eastern Europe &c.



"administrative corps" would recruit for, train and administer, two or three "fighting groups," each of which would move intact on relief and remain so in war as in peace. This brings us to a consideration of how the battalion and company should be organized for regular warfare, both in Europe and Asia.

IV.—*Organization of a Mechanized Battalion and Company.*—In Asia our probable adversaries may be mechanized only to a small degree, hence the bayonet man must still form the crucial link of our chain, in order to conquer the ground and to consolidate it after conquest.

He will need :

- (1) The bayonet, assisted by the grenade and the mechanized mortar, for the first task, the offensive one ;
- (2) The machine gun or machine pistol, assisted by the spade, for the second, the defensive role.

This postulates youth and physical vigour for the bayonet men and extreme lightness in his equipment for his dash over the last few hundred yards. This is equivalent to going back to the light armed skirmisher and heavily armed legionary of classical days. Similarly, we shall have to transfer our men, as they grow older, from bayonet companies to machine gun or mortar companies, from these again to reconnaissance and tank companies, and from these once more to light artillery, engineer and workshop units, finally, to the garrison battalions needed for certain essential points. Our proposed organization into large "administrative groups" would enable us to do this with economy and ease.

The bayonet companies of the battalion will need such close and immediate support by fire as can come only from their own comrades of their own battalion, in other words from machine gun companies. But for an attack across the flat against entrenchments the low trajectory machine gun is not the most perfect weapon. At least half the armament of the machine gun companies should consist of rifled mortars on small self-propelled mountings, whose ammunition supply problem can be solved by the cross-country machine. The other half of the "fire unit" in the battalion should have machine guns, to give defensive fire power, carried in machines. A reserve of each type of weapon, say four per battalion, should be carried with the ammunition reserve, so that the proportion of each might be altered according to whether the battalion's task be offensive demanding more mortars, or defensive demanding more machine guns. The same teams can well be asked to serve either.

The same principle is carried into effect in the light artillery batteries which are armed with self-propelled 3.7" howitzers for the offensive, or with a 3-pdr. high velocity tractor drawn gun for the defensive. The

provision of a few spare pieces of either will enable the proportion to be altered from 50:50 to 75:25, in either direction.

Each platoon of bayonet men should have a machine "pistol" of the Thompson class for immediate consolidation work and for "mopping-up," besides percussion grenades.

Scouts, mechanically carried, are an important component of the battalion, and must not be overlooked.

V.—Mountain Warfare Troops.—It is impossible for regular troops to be mechanized as long as they are liable to be called upon to fight in mountain country. Fortunately we possess the best mountain warfare training ground in the world, and a supply of mountain warfare personnel excelled by none and rivalled only by the Riffs. We know where our mountain warfare commitments lie, and hence there is no reason why we should not fill the gap in our military organization and create specialised mountain warfare formations, like those of foreign powers, thereby relieving mechanized regular troops from an uncomfortable "arrière pensée." Accordingly, we need a dozen mountain brigades of all arms specially recruited, trained, organized and equipped for service on the North West Frontier, on the Hindu Kush, or in Kurdistan. It is not long since we needed such in the Caucasus, in the Judæan Hills, in Macedonia, and, last but not least, in Gallipoli.

Mountain troops should nowadays find a greatly increased scope from the potentialities of air supply. Two heavy commercial aeroplanes could supply with ammunition and with a bare minimum ration a brigade, less its administrative personnel which would become redundant. Such machines would not have any offensive fighting value, so would not be missed by the "Independent" Air Force.

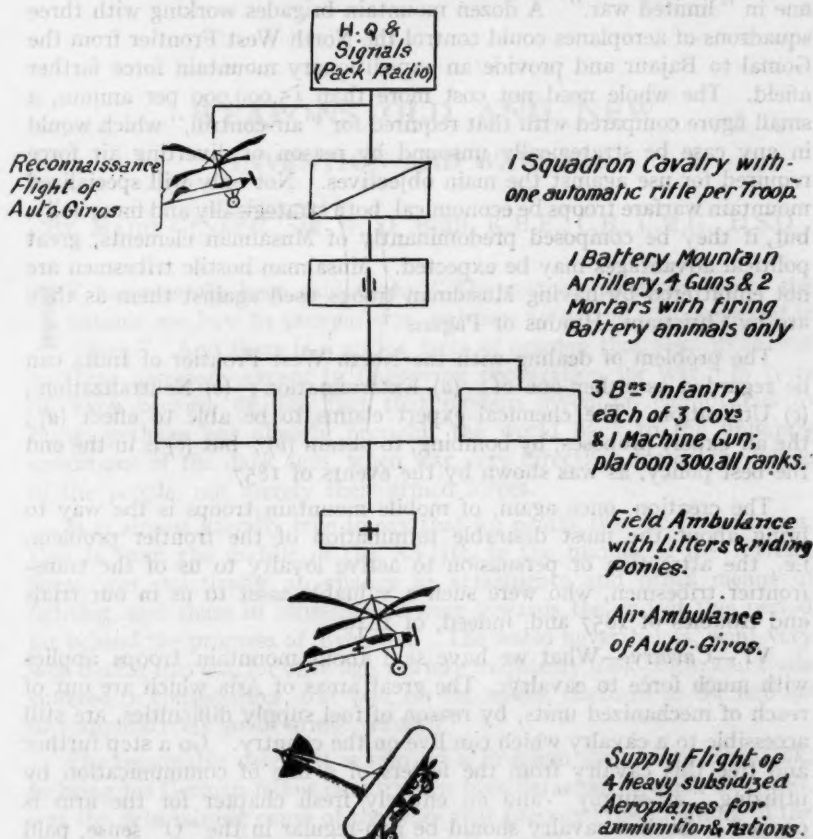
In fact, a brigade need consist of little more than its offensively armed fighting personnel, both line of communication and baggage guards being superfluous; for instance, H.Q. and signals; three battalions, about 350 strong, over 300 being "rifles"; one mountain battery, with a howitzer or mortar section; one squadron of cavalry; one field ambulance with riding ambulances and litters (see Diagram III).

The question of evacuating badly wounded men has been a difficulty in the way of "air-supply" in the past, but the development of the auto giro should to-day give us a practical air ambulance of the required type. Cross-country armoured ambulances could often be used to assist this work where valleys are traversable.

Air distances in mountain warfare are always very short, hence we may expect both supply aeroplanes and auto giro ambulances to do more than one trip in the day. The columns must of course be capable

Diagram III

*Proposed organization of a Mountain Brigade
for operations in S.W Asia, N. Africa &c.*



of finding fresh meat, vegetables, fuel and fodder for themselves, by time-honoured methods.

Brigades as described above should be composed of fighting men and able to put more actual rifles into action than present formations with their huge transport columns and escorts. In fact the present-day formation, with all its impedimenta, permanent picquets and wired-in posts, is really adapted only for "valley-warfare." A column cut loose from all these ties could often operate from the ridges and higher ground, leaving the enemy down below.

Conversely, the proposed formations would be far preferable to aircraft acting alone, even could these actually succeed in inflicting real military defeat on a hostile tribe. The reason is economy, a very strong one in "limited war." A dozen mountain brigades working with three squadrons of aeroplanes could control the North West Frontier from the Gomal to Bajaur and provide an expeditionary mountain force farther afield. The whole need not cost more than £5,000,000 per annum, a small figure compared with that required for "air-control," which would in any case be strategically unsound by reason of diverting air force required for use against the main objectives. Not only will specialized mountain warfare troops be economical, both strategically and financially, but, if they be composed predominantly of Musalman elements, great political advantages may be expected. Musalman hostile tribesmen are not embittered by having Musalman troops used against them as they are by Christians, Hindus or Pagans.

The problem of dealing with the North West Frontier of India can be regarded as either one of: (a) Extermination; (b) Neutralization; (c) Utilization. The chemical expert claims to be able to effect (a); the air expert proposes, by bombing, to obtain (b); but (c) is in the end the best policy, as was shown by the events of 1857

The creation, once again, of mobile mountain troops is the way to bring about the most desirable termination of the frontier problem, i.e., the attraction or persuasion to active loyalty to us of the trans-frontier tribesmen, who were such a valuable asset to us in our trials and troubles of 1857 and, indeed, of 1849.

VI.—*Cavalry*.—What we have said about mountain troops applies with much force to cavalry. The great areas of Asia which are out of reach of mechanized units, by reason of fuel supply difficulties, are still accessible to a cavalry which can live on the country. Go a step further and free this cavalry from the fetters of a line of communication by utilizing "air-supply" and an entirely fresh chapter for the arm is opened. Such a cavalry should be non-regular in the "Q" sense, paid in peace by a capitation grant on a Cossack or Sillidar basis (the Sillidar, of 1880, not that of 1914), mounted on hardy entires and supported by a "horse mountain" artillery like that of the Cossacks. It will need a standard of skill-at-arms, training, enterprise and discipline no less high than that in the past.

Overseas cavalries provide us with the material, whilst the Regular cavalry could be distributed over Yeomanry and Indian auxiliary force mounted brigades as instructors at, say 25 per cent. in each rank.

WEAPONS OLD AND NEW INVENTION AND WARFARE

BY MAJOR-GENERAL SIR W. D. BIRD, K.B.E., C.B., C.M.G., D.S.O.

IT has recently been said that: "The eternal questions before the nations are how to prevent war and how to defend themselves if it comes." And there is a strong force of opinion that sees no answer to these questions except in improving preparation for war; in spite of, even because of, the fact that modern invention cannot fail to bring, perhaps has already brought, the world back to the unhappy conditions of the dark ages, when war very directly affected the whole of the people, not merely their armed forces.

It is almost literally true to say that for nearly two recent centuries, that is from the middle of the XVIIth to the middle of the XIXth, there was practically no change in armaments and other means of fighting, and these in consequence were towards the end of this period far behind the progress of invention. The world nevertheless, went very well during this era, for although warfare frequently took place, and trade suffered in consequence, war was, on the whole, confined to the actions of comparatively small armed forces.

The reasonable desire, it is said, of a Prussian statesman, Bismarck, to bring his German fellow-countrymen together, even against their will, was the determining cause of the wars that preceded the founding of the German Empire. Given such a desire it was the obvious duty of the military authorities to do all in their power to facilitate its attainment, that is to ensure victory. Among other measures the Prussian army was consequently armed with a breech-loading rifle, and this gave it a great but temporary advantage over all other armies that still clung to the muzzle-loader.

It is very probable, indeed almost certain, that the greater security obtained by those who first introduce a more efficient if more complicated weapon, will be but temporary, unless it can be used in war before others can copy it. This the Prussians were able to do in 1866, when an important factor of their success over

the Austrians was the possession of a rifle that could fire perhaps five times faster than that of the Austrians, and could be loaded when lying down, whereas to load the Austrian rifle the soldier had to stand up.

The happy result of the application of mechanical science in that war naturally stimulated the military authorities of the civilized powers to take full advantage of it, and breech-loading rifles were on all sides busily introduced, and soon breech-loading cannon and machine-guns also ; and the killing power of armies was in consequence largely increased. This fact, however, was apparently unheeded in the thrilling excitement of the race—the race of armaments, and every nation also wished, of course, to be in front if war came, regardless of other consequences. Science therefore had taken ominous charge of preparation for war on land ; but it must also be pointed out that such preparations have, as a by-product, sometimes resulted in important advances in industry and increase of industrial skill.

Meanwhile much the same influences had been at work in the navies. In 1853 the French built some armour plated batteries, as they were called, for employment against the Russians, with whom war was then imminent. These were followed, in 1859, by the French armoured vessel, "Gloire" and the British ironclad "Warrior." As a result, the navies of the world found that their comparatively cheap wooden fleets were useless, a fact that was driven home in 1862, in the American Civil War, by the exploits of the "Merrimac," a wooden frigate, which had been scuttled, but was raised and armoured. And every nation had to start, at immense cost, to rebuild the fleets in iron and steel, to the ultimate advantage of no one, not even to that of the miners and steel and iron founders. Science then also dominated the construction of warships, and forty years later, Britain, as a result, was able suddenly to try to shake off naval competition by producing the expensive battleship "Dreadnought" ; which was so powerful as at once to make all existing battle fleets obsolete, Britain's as well as the others, and so costly that it was hoped that no nation would try immediately to copy her. This proved to be a miscalculation, and the peoples, again at largely enhanced cost, merely started on even terms in another lap of the great and ruinous race.

The civilized, and particularly the European, world at first reaped great advantages over the less civilized peoples from its vastly improved armaments, and the conquest of Africa and large portions of Asia, which had been proceeding slowly, was consequently accelerated to such break-neck speed and with such rivalries that serious quarrels between the great European powers were barely avoided. But since they did not take place it may be said that Nemesis, who is supposed to be on the

watch to punish prosperity, was for the moment outwitted. She seems, however, to have remained grimly on the look out for the opportunity to visit with losses and suffering those who thought that armed fortune had really come to them with both hands full of good gifts.

Up to the latter part of the XIXth century means of transport and means of communication had set a limit to the size of armies, but in 1914 progress had changed all this, for the railway, the lorry and the telegraph then enabled millions to take the field where only hundreds of thousands could do so in the past. In the earlier wars, when the fighters were few, the muzzle-loaders had killed their thousands, as the numbers increased the breech-loaders and slow-firing guns killed their tens of thousands, but in the late war, when armed millions met, the machine-guns and the quick-firing guns again multiplied the losses by ten. Nemesis therefore had had her turn. Before the end of the war science had produced both poison gas and the means of using it, and had so developed submarines, aeroplanes and armoured vehicles that not merely the fighting forces but the so-called non-combatants were about to be drawn into the *mêlée*. Further, the Europeans found that even when the war was over Nemesis was still at work, for the sale of their un-wanted arms had placed, or was again bringing, the peoples of the conquered or half-conquered continents on to an equality with them.

The sole moral justification of change in armament in time of peace is that the probability of war will be reduced, and that economy of life through the shortening of war will result, should it break out; the requirements of self-preservation, the need of equalling others, and the desire to reduce expenditure in time of peace, are the sole material justifications for such change. In spite of the terrible results of applying science to war a strong current of opinion, as has been pointed out, is demanding that science should be asked to lead the nations on, in the hope apparently that applied science will bring safety, and also economy both in peace and war, i.e., economy of life and economy of resources. Whether it will succeed in doing so is to say the least doubtful. It is, for instance, admitted that tanks cannot move over ground covered with trees, or over rough mountains, or through marshland; in other words, the action of armoured vehicles is confined to roads or to open and comparatively unobstructed areas. Even now, however, there exist, it seems, machines that can rapidly dig trenches or sink pits, and machines that can rapidly fill them with quick-setting cement; and perhaps also machines that can plant pickets in the cement capable of resisting the impact of a tank, but if not, human hands can easily do so. If then the open areas can in this, or some similar, manner be closed to tanks or other armoured vehicles until the obstacles are removed, the adoption

of such armaments will not result in economy of life and armed force, but, at any rate in the Continental armies, merely in the substitution of formations using petrol engines for those that formerly used horses ; and at least as many infantry, artillery, and engineers will be needed on the ground in the future as in the past. So that even if science can largely cancel out the power of her products on land, and even if she may similarly do so in air and water, nations at best will be no better off than they were before the advent of the inventions.

As a result another current of opinion fearing what may happen between introduction and neutralization, realising that new inventions are likely to be continually devised, and impatient of the expenditure that science demands, is asking for the limitation of her products ; the limitation of battle-ships or cruisers on the sea, and of fighting formations in the air and on the land. When, however, it is considered how comparatively harmless the last great war would have been if the combatants could have been armed with the weapons of the war which ended in 1815, it seems that to call a halt in invention would be more economical, more advantageous, and perhaps easier than to attempt to limit armaments. For if every nation agreed not to change its weapons for twenty years, science might by that time be so much out of touch with war that a further respite might readily be arranged ; although of course no arrangement can alter such facts as that one nation is more numerous than another, or possesses wider resources or greater factories.

Whether to limit invention is or is not practicable it seems, at any rate, that, if some brake cannot be applied to the destructive progress of science, Nemesis is likely to decide that scientific nations must meet the fate that overtook the Kilkenny Cats, and leave the world to the less progressive. For the use of force to settle international questions is not yet outside the bounds of possibility, since there are unfortunately some questions that, if raised and pressed, can only be settled by an appeal to its arbitration.

THE NAVAL AIR SERVICE IN THE NORTH SEA

A REVIEW¹

By MAJOR C. C. TURNER, A.F.R.Ae.S.

GREAT Yarmouth Air Station attained during the war considerable importance due to its task of opposing the German air stations at Borkum, Norderney, and Zeebrugge. Its activities played a part in disputing the efforts of the German naval air service to establish an aerial supremacy over the North Sea, and also in combating the menace of the Zeppelin airships; and Mr. Gamble, while writing intimately about the affairs of Yarmouth Air Station, has done this with so much reason and sense of values that his book, which was intended originally for private circulation, takes its place in the library of historical war records.

The chapters are arranged in an order presenting the operations, period by period, from the British and the German points of view. The development of the British naval air service up to the time of the war is followed by that of the German naval air service. Thereafter, year by year, come the stories of the operations, Mr. Gamble's descriptions of enemy activities having, moreover, been checked by German authorities, and enemy operations being described by German officers who took part in them. There is much information from German sources never before published.

It is curious to observe the similarity of the problems which confronted both services. The German air service made the same complaints concerning poor equipment as did ours. Bombs, engines, aircraft, all came in for castigation on both sides of the North Sea. There was a great multiplicity of aircraft types, which proved wasteful. In 1917 no fewer than forty-three different types in the R.N.A.S.! This, of course, will not occur in future wars, for not only has the lesson been learned, but the adoption of all-metal construction connotes mass production, and this is incompatible with great variety of types. Divided counsels

¹ "The Story of a North Sea Air Station," by C. F. Snowden Gamble. (Oxford University Press, London.) 2rs. net.

in Great Britain and between the Allies aggravated matters, as Mr. Gamble proves by instance after instance. Even as late as the entry of the United States into the war, confusion reigned.

"The Government at Washington failed to appreciate the complexity of the problem of aviation supply and experience in Europe, and its natural desire to develop a policy of its own had a most disturbing effect on British contracts in America, and on the supply of raw material, more especially of silver spruce."

The air operations over the North Sea were but a fringe of the war. One of the impressions given by this book is that right up to the end their chief interest was technical. That, of course, is in large measure true as regards aircraft in all the theatres of war by land or sea, although on the Western Front aeroplanes came to be used in line-smashing operations and also definitely in independent offensives.

But more particularly in the North Sea the aircraft employed by both sides were ill adapted for their tasks, and the story throughout is one of failure more than accomplishment. Even now—ten years after—the flying boat has not emerged from the stage of technical development, and design differentiation for specific purposes is still to come.

A vast amount of energy was spent by Great Yarmouth Air Station in connection with the submarine menace, with the two-fold object of warning shipping and of destroying the enemy; but in the end the submarine was countered by methods in which, it must be admitted, aircraft were of no very great account. Seaplanes and flying boats from Great Yarmouth occasionally sighted submarines and gave warning, but, with rare exceptions, submarines, having been observed and attacked, managed to escape. Doubtless their movements and offensive power were hampered, but their operations were not prevented by aircraft.

On the other hand, aircraft achieved definite success in convoy patrols. Taking into account the short sea voyages where air escort was practicable throughout the voyage, and leaving out the ocean convoys (which, however, were escorted by aircraft through the danger zones), it is important to note that from April, 1917, to the end of the war 312 ships were torpedoed while in convoy. Of these attacks only two occurred when the vessels had an air escort in addition to the usual destroyer or cruiser guard. In no case was a ship lost from a convoy when a kite balloon was flown from an escorting ship.

But although aircraft can protect ships and can detect submarines, they are not able, judged by the experience of the war, to destroy them. As already said, sea aircraft were ill adapted for their task, and, moreover, the method of attack left much to be desired. Mr. Gamble points

out that pilots were generally too precipitate in their attacks. As a rule only the periscope and, more rarely, part of the conning tower was visible—usually two or three miles away. By the time the aircraft reached the spot and was diving to the attack the submarine had submerged. All that could be seen was a swirl in the water, and perhaps a trace of oil, and the pilot dropped his bombs on the position he estimated the submarine to be in. Having dropped his bombs he was impotent until he had returned to his base and re-armed; or, if he kept a few shots in his locker, his fuel supply was being used up, and meanwhile the submarine, warned by the noise of the explosions, kept below. The better plan, but a plan rarely if ever adopted, would have been to refrain from attacking, and to cruise about in the neighbourhood on the fair chance of bagging the submarine when she broke surface again.

Since the war the improved quality of our sea-going aircraft, their improved armament, and tactics studied in the light of war experience, would, if put to the test, lead to somewhat better results. On the other hand, it is not impossible that the submarine will be better able to defend itself against aircraft, and will not be compelled to submerge on all occasions. In this connection post-war developments can only be proved by the test of reality. For example, the aircraft-carrying submarine may prove to be formidable, and its case should not be hastily judged in the light of the obvious difficulties in the way of the successful employment of its small single-seater.

Two critical questions for Great Britain in any big war of the future would be the immediate employment of aircraft and submarines by the enemy. In the late war these menaces were of gradual development, in the next war they will presumably reveal themselves in strength in the first few weeks. With regard to the submarine, it is evident that training and equipment must have in view co-ordination between aircraft and surface craft designed for dealing with it. There was great lack of such co-ordination.

But there is no reason why the lesson of the failures due to lack of co-ordination should not now have been learned, and it is the peculiar value of Mr. Gamble's book that without bitterness it relates occurrences which throw light on these matters. Over and over again he has occasion to give instances of the lack of mutual understanding and sympathy between the Fleet and the Air Service, even when the Navy had its own complete Air Service. This state of affairs was not peculiar to Great Britain, for there is abundant evidence (and the author quotes interesting documents) showing that precisely the same state of affairs prevailed in Germany. Before the war, both British and German naval authorities had gone far in recognising aircraft possibilities. Naturally,

they did not go far enough for aeronautical enthusiasts; but, as Mr. Gamble readily admits, they could not afford to commit themselves and their policies to an untried instrument which was continually affording proof of its fallibility.

The British Admiralty gets full marks for its enlightenment in some matters. Especially was its equipment policy justified. The Royal Naval Air Service was not heir to so many troubles as the Royal Flying Corps, and this happy result was due in the main to the Admiralty policy of fostering the design enterprise of private contractors rather than running an exclusive design department of its own. But no one can read this book without being convinced of the evil of divided control in the matter of equipment, and whatever changes may be in store it is not likely that the principle of unified equipment control will be abandoned. The equipment authority, however, must be so constituted that under a Supreme War Council air operations by land and sea and independent air operations shall receive due provision.

The outstanding difficulty is that of personnel, and it is of the utmost importance that another war shall not find us hampered by an unstable system. There will be little time for revolutionary changes of organization. Now, whatever changes may be in store, one thing—in my opinion a vital thing—must be secured. It is an error of the gravest kind in its consequences and its reactions to suppose that flying is not a whole-time job, and it is an error to which both soldiers and sailors are prone. Decidedly the more sailors and soldiers there are with experience of flying, and especially of flying in the observer's seat, the better will it be, but the pilot must be a professional, and the ten-year pilot is superior to the seven-year pilot, whilst the three-year pilot should be regarded rather as an "improver." Further, it is an error to suppose that a man who puts in three or four years flying and then returns to other duties will ever go back to flying. Experience shows that once a man has been forced to leave flying, either on returning to other duties or to civil life, he is so disturbed by the unwanted change that he suffers a reaction and thereafter keeps as far away from flying as possible.

In the nature of things the constitution of an air service, whether an independent one or an appanage of another service, must be different from that of navy or army. There are profound psychological and temperamental differences to allow for, just as there is a wide difference between the sailor and the soldier. Discipline and routine must take note of these differences, and any attempt to cut sailors, soldiers and airmen to one pattern will certainly end in failure.

Both Britain and Germany suffered loss of effectiveness through a perfectly natural inability on the part of naval officers to understand

the airman and his craft. Take, for example, the air and sea operations in the Bight of Heligoland in August, 1918, when a British attack by coastal motor boats completely failed, for they did not torpedo any enemy craft and were themselves destroyed. We are given both British and German accounts of this action, which is historic for the reason that in it aircraft inflicted greater loss on surface craft than at any other time in the war.

"During one of the incidental discussions held between the Naval and Royal Air Force officers concerned while they were planning the operation," writes Mr. Gamble, "the flying boat and seaplane pilots from Great Yarmouth and Felixstowe were unanimous in their opinion that if the coastal motor boats were allowed to operate off the Frisian coast unescorted by 'Camels' the former craft would be all destroyed by the Brandenburg monoplanes. Unfortunately this warning was not heeded, and the tragic result of disregarding it was but another illustration of the penalties incurred by lack of co-operation between sea and air craft and between those who controlled their movements."

As to airships, it is fairly safe to prophesy they will not play a serious part in any future war, although they might conceivably be employed in ocean naval reconnaissance and as aircraft carriers. So far as the war of 1914-1918 was concerned, they played their part, suffered heavy casualties, and were finally abandoned as an offensive weapon.

One of the most useful parts of the book is the summary of each of the important attacks, giving the distance flown by each airship, its time in the air, speed and altitude. Considering the speed limits of these vessels, it is remarkable they did so well. They chose their weather, of course; and they broke down, especially on the occasion of the greatest of all raids, when the weather service failed to give them correct advice, but one cannot withhold admiration of the courageous handling of these ships in the face of great difficulties.

Great Yarmouth often had little luck in dealing with the raiders, for at first the available aeroplanes were too deficient in climbing power, and also raiders took advantage of clouds, which are seldom absent from North Sea skies. An airship is not always a conspicuous object. Seen end-on at a distance of a few miles in certain lights it looks no more than a tiny bubble. For weeks pilots from Great Yarmouth patrolled in the small aircraft carrier, H.M.S. "Kingfisher," in the vicinity of the Haaks lightship. Seaplanes were sent off from this trawler and her sister ship on almost every calm night during 1915, 1916 and 1917, but the pilots of these machines never sighted a Zeppelin airship, although during this time a large number of raids were made on England by airships which must have crossed close to them.

Surprise was often expressed at the climbing powers of Zeppelins, enabling them frequently to avoid our aeroplanes. On this point, Mr. Gamble explains: "The rate of ascent of an airship is purely a question of the capacity of the pressure valves. These were designed to answer to a rate of ascent of 8—10 metres per second. This value was uniform in all airships and at all altitudes. That is to say, the rate of ascent does not depend upon engine power or the density of the surrounding air. Therefore, it took the same period of time to ascend, say, 2,000 feet whether the airship was initially at 100 or at 10,000 feet, so the minimum time taken to ascend from 14,000 to 16,000 feet was little more than a minute compared to the quarter of an hour taken by the attacking aeroplane."

As to the moral effect of the raids it was considerable, although the material damage done was not very heavy. They absorbed and partially immobilised man and gun power in this country: "We were compelled to retain at home (in addition to the naval units along the east coast) twelve squadrons which could otherwise have been sent overseas. These squadrons alone absorbed 200 officers and 2,000 men; in fact, at the end of 1916 no fewer than 17,000 officers and men were retained in this country for anti-aircraft duties. There were over 400 anti-aircraft guns in this country when every gun was needed overseas."

There is still a school which believes that the airship will be employed in a European war, and I have recently heard it asserted that London will again be bombed by airships. The German authorities, however, came to a very different conclusion. In 1918, the German naval authorities ordained that aeroplanes should be used instead of airships for the purpose of observation patrols in the North Sea, as airships were unable to fly westwards during the day at a height favourable for observation on account of British defensive patrols and the danger of incendiary ammunition to lighter-than-air craft. As a result, the building of big reconnaissance sea aircraft was ordered, and some of these were sent to Norderney for the purpose of attacking the Grand Fleet while it was at anchorage at Scapa Flow; but for various reasons this plan was not executed.

Although the Zeppelins may be held to have failed as a raiding weapon, they were successful in maintaining an effective watch over the North Sea and preventing our naval forces from delivering surprise attacks. Daily patrols were established to the Norwegian coast, to the Moray Firth, and in the Bight. During 1916 the average duration of these patrols was twenty-four hours. Owing to the weather conditions, airships were not able to take part in the Battle of Jutland, but they did some scouting on the day after, and on the majority of the occasions when

the German Fleet left its bases airships co-operated. Earl Jellicoe has testified to their value in this direction in favourable weather; but Admiral Scheer expressed the opinion that scouting by airships is somewhat negative in character, since the fleet is only informed by them that the main hostile fleet is not within their field of vision, whereas the important thing is to know where it actually is. Yet there is little doubt that Zeppelins saved the German cruiser squadron on the occasion of the Yarmouth raid, and they were instrumental in bringing about the sinking of the "Nottingham" and "Falmouth."

There is room for regret that the war ended while some of the newer weapons were still almost untried. This is especially true as regards the torpedo launched from an aircraft. The general failure of this weapon has led many to believe it has no future; but such a view takes no account of the progress which has been made since the war, the torpedo itself, for example, having been specifically developed and differentiated in design from the ordinary torpedo, whilst the tactics of torpedo plane attack from the air are sedulously studied and practised.

The first attack on our shipping by the Zeebrugge Torpedo Plane Flights took place in November, 1916, when a steamer was sunk off the mouth of the Thames. Many further attempts were made, but early in 1918 the Germans abandoned a method which proved far more costly than fruitful. The Germans themselves claimed as their chief compensation that the technical development of the torpedo plane helped in the evolution of long-distance multi-engine reconnaissance machines. Had they but persevered a different story might have had to be told. Lack of understanding of the possibilities by the High Command, and internal dissensions, prevented the development of a weapon which we now know may become very effective.

The illustrations are a great attraction to Mr. Gamble's book. They include several German photographs, one showing the burning of a British airship taken from her assailant, another the burning of one of our flying boats taken by a German airman. The pen-and-ink drawings of aircraft by Mr. Leonard Bridgman, who was himself an officer at Yarmouth Air Station, are excellent and technically accurate.

Yarmouth Air Station was long ago closed down. The last days are told with unavoidable pathos, but not without humour. It fell to one officer to take a final walk through the empty sheds, hoping perhaps that in time to come, people (paraphrasing what Maurice Baring had said of the late Raymond Asquith), would say of those that had been there that, "Being what they were, and doing what they did in the way they did it, they had made it a little easier for valiant men elsewhere to win the War."

THE INFLUENCE OF GROUND ON MODERN MILITARY OPERATIONS

BY MAJOR-GENERAL C. P. DEEDES, C.B., C.M.G., D.S.O., *p.s.c.*

On Wednesday, 14th November, 1928, at 3 p.m.

MAJOR-GENERAL C. E. CORKRAN, C.B., C.M.G., *p.s.c.*, in the Chair.

THE CHAIRMAN, in introducing Major-General Deedes, said: As you know, the lecturer is fresh from editing the new Field Service Regulations. He is also Colonel of a Light Infantry Regiment, and the very title "light infantry" suggests to our minds the most scientific use of ground in battle.

LECTURE.

THE subject of this lecture recalls to mind the story of the soldier in the South African War of thirty years ago, who, on topping the last rise when advancing towards the Boer position and seeing some thousand yards of bare veldt between him and his enemy, lay down flat and said he had no grudge against Kruger! That soldier appreciated the importance of fire in its relation to ground, though perhaps he did not sufficiently consider the value of its twin—mobility. It is from the point of view of mobility and fire that I propose to discuss the question of ground this afternoon.

It has been stated on high authority that "War is movement." Like the sea, and the air, ground is a medium for movement. Unlike them, however, ground restricts movement generally by natural and artificial obstacles, and such obstacles are bound to affect the movement of peoples and especially of armies. As a consequence, the flow of commerce, the communications between nations and the passage of armies have, in the past, followed nearly always the same routes. For example, the passes through, or the ways round, such mountain ranges as the Himalayas, the Alps, the Pyrenees, or river valleys such as those of the Danube, the Euphrates or the Nile, have witnessed for century after century the ebb and flow of large armies.

I propose to consider first, whether, as the result of modern inventions, strategy will break away from such tendencies, and whether a freer and more elastic system of war will arise. Will leaders of the future who

desire to apply force in a particular area at a particular time be able to ignore the obstacles which nature or man places in their path? Hitherto the degree of force to be applied has depended largely on the number of human beings which can be collected for its application. Do these conditions still obtain? With the development of science, the application of force may take new and startling forms. But we are dealing with facts as they exist to-day, and so long as large armies are organized and maintained on their present lines, is it possible for them to cut adrift from their channels of communication for any but very limited periods of time?

A hundred and more years ago, a British General, who carried out successful campaigns in spite of the indifferent administrative machinery of the day, wrote as follows: "It is self-evident that an army is not a machine that can move of itself; it must have the means of moving . . . Rest assured that an army cannot move without horses and wagons." Until an army is turned into a machine capable of moving and maintaining itself independently of the present system of communications, so long will Sir Ralph Abercrombie's words remain true. If we are to operate with large armies away from certain definite lines, it is not sufficient to ensure that the fighting troops can dispense with roads, bridges, rail and waterways; it is essential for the administrative services to be able to maintain them while so operating. The more scientific the organization of an army, the more important becomes the administrative side of war. The absence of a repair unit, or the loss of a petrol convoy may entirely neutralise the effect of a brilliant strategical manoeuvre. Man and horse can live on half rations, but a carburettor must always be full. We thus arrive at a paradox; the more use we make of science and invention to produce mobility for our fighting forces, the more complex is the machinery required to maintain this mobility, and the more elaborate becomes the system of administration. This in turn reacts on the mobility of the force. I labour this point, because if we are to take advantage of the ground in order to give full effect to the mobility of our forces, we must ensure that our arrangements for keeping them effective can follow suit. It seems, then, that in order to move large armies, ports, railways, roads and canals will be as important for communications in the future as in the past, and that prolonged operations away from them will not be feasible.

Even though aircraft and mechanical vehicles can over-ride those obstacles which have interfered with movement in the past, such independence can be temporary only; before long they must return for replenishment and maintenance, while the main columns composed, as in the past, of marching infantry can move but slowly and for a short time away from existing communications.

But even though large armies may be unable at present to leave the beaten paths, the study of ground from the point of view of modern armaments is none the less necessary. This study has always been a factor in the operations of successful commanders. As a means of approach, of withdrawal or of protection, as an obstacle or an aid to achieving surprise, ground will be a feature of future as of past campaigns. In a recent issue of the *Army Quarterly* is an interesting article on Sir Arthur Wellesley's campaigns against the Mahrattas in 1803. The article brings out the importance which Sir Arthur Wellesley attached to the geographical features of the country over which he was operating. And again, the skill with which Jackson utilized the features of the Valley of the Shenandoah as a covered approach against Washington, or as a means of separating the Federal forces, or as a passage by which to withdraw in order to join the main Confederate armies can be appreciated by those who have to operate with air and mechanized forces to-day. Then consider the methods adopted by General Maude in Mesopotamia and by Lord Allenby in Palestine in order to make the best use of the ground and cover available to deceive and surprise their enemy. Or again, the use made by Ludendorff of the Masurian Lakes and the close nature of the country in East Prussia in his operations culminating in the victory of Tannenberg.

The study of ground is all the more important to-day—not only to enable an army to escape or deceive hostile aircraft, but also as a means of facilitating the operations of mechanized forces, of interfering with those of the enemy, and for the purpose of causing delay in an adversary's movements.

It will be necessary to discover from air photographs and reports the possibilities of concealment for marching columns or specially dangerous portions of the routes—such as defiles and cuttings, where hostile air attacks will be most effective: the state of vegetation as affecting existing or proposed camouflage must be ascertained: the condition of obstacles must be reported. Yet another factor is weather; full use must be made of the improved methods of forecasting weather conditions and their effect on the ground. All such details will affect the distribution of an army and the possibilities of effecting surprise and obtaining economy of force.

In the case of mechanized forces, which are particularly sensitive to ground, reconnaissance is of vital importance. Such study is necessary, not only in peace in order to decide where and in what form such forces can best be used, but it also includes the acquisition of daily and hourly information in order to discover what obstacles exist or are being placed in the way of movement, and what areas

are suitable to give effect to the mobility and fire power of armoured vehicles. During the recent experiments which have been carried out in this country, rapid and accurate reconnaissance has proved to be essential if a mechanized force is to be employed to its full effect and without incurring disproportionate loss. Although most of Salisbury Plain is particularly suitable for cross-country movement, even there occasions have occurred where several miles of ground unsuitable for the employment of a mechanized force have been met. Again, the influence of a river in all operations has been most marked; if the river line is held, it is necessary to secure a bridge-head before commencing the task of bridging; this takes time, and time is the last thing which a mechanized force—like Napoleon—likes to be asked to give. While this process of reconnaissance and advanced fighting is taking place, vehicles must be distributed on such ground as will enable them either to escape observation or to minimise the effect of the inevitable air attacks which will be made against them, if they are discovered.

The greatest value of a mechanized force can be obtained only when it has a definite target at which to strike, and when it can secure a suitable route which it can follow without check in its movement to attack. The length of this route is of comparatively little importance, since, owing to the mobility of the force less time is spent in moving round obstacles than is incurred in crossing them.

The suitability or otherwise of the topography of the theatre of war must play a considerable part in coming to a decision as to whether it is wise to employ a mechanized force or not. It would be interesting to study the steps which would be necessary for such a force to carry out one of its rôles, namely, that of "a special operation involving a long movement up to the full capacity of the force to maintain itself for forty-eight hours at a distance from the main army" (I quote the official instructions on this subject). Compare the problem in such a country as Virginia with that which confronted Stuart when he made his memorable ride round the Federal army, crossed rivers in flood, acquired valuable information, inflicted material and moral damage on the enemy and escaped being brought to action during his two days' operation. Or again, compare the task which was allotted to his cavalry by Lord Allenby in his final operations in Palestine with a similar task which might have been given to armoured vehicles had such been available.

It happens that I have been rather intimately connected with the revision of Field Service Regulations, and in view of that experience I will venture to consider from the tactical point of view what effect ground is considered to be likely to play under present conditions. It is clear that armies cannot regard ground from the same point of view as they

did even twenty years ago. For instance, wooded country, which used to be avoided as tending to make control so difficult, to-day possesses distinct advantage from the view of protection against aircraft and immunity from attack by armoured vehicles. Moreover, wireless has enabled communication to be established and maintained in country which earlier forms of signals would have found impossible. It must be remembered, however, that efficient reconnaissance is more than ever an essential part of operations in wooded areas (compare Jackson's operations against Banks round Winchester in May, 1862), and that small areas of woodland are particularly dangerous if the enemy is using gas, or if the hostile aircraft knows them to be occupied.

Closely allied to the foregoing is the question of broken country or thickly populated areas which render co-operation between the different arms a matter of difficulty: such ground may offer opportunities to well-trained infantry, inasmuch as the hostile artillery will find it hard to observe, and hostile armoured vehicles will be unable to manœuvre freely. For this reason it is conceivable that good infantry will deliberately choose to operate over close country, and in any case such country should not be ruled out for attack, even if co-operation with the other arms may not for the moment be practicable.

Again, modern forces, when in process of advancing or withdrawing, will tend to move by bounds from one geographical feature to another. Whether these features are called "tank-proof localities" or by some other name, the object of moving by this method is to secure, when halted, an obstacle such as a river, swamp or rocky area not only in front, but also on the flanks, so as to facilitate the anti-tank defence which is so essential for rest and security.

In the case of artillery, localities will be selected along the route to be followed by the force, for occupation by the guns, in order to secure immunity from tank or armoured car attack for the remainder of the force, while on the move. For this purpose, guns will be leap-frogged, mechanized batteries being very suitable for this rôle.

In defence, we shall no longer see infantry seeking out those dominating heights, which like a certain position taken up by a Confederate General in the American Civil War, provide "a very pretty view, but a d—d bad prospect." So long as they can protect the observation required by their artillery, they will endeavour by their power of concealment, one of their greatest assets, to take up inconspicuous positions giving good short fields of fire, and by a free use of their automatic weapons conserve the energies of the riflemen.

Apart from natural obstacles, which I have mentioned already, the part to be played in future wars by the creation of artificial obstacles will be

considerable. The more mobile operations become, the more will each side strive to restrict the mobility of its opponent, and the more may we expect to find use made of land-mines, craters, road blocks, floods and the like. It must be realized, however, that such expedients for delaying an enemy's advance must be carried out on a well co-ordinated plan, so that he may encounter a belt of obstacles, and not a few isolated obstructions which he can turn.

In the case of our Empire, we are always faced with the difficulty of fashioning an organization which will be sufficiently elastic to prove suitable for different types of ground and enemy. We never know where we may have to fight. China, Egypt, South Africa, the Middle East, all have their peculiarities of ground. In many respects the introduction of mechanical cross-country vehicles has simplified the task of organization, since the same vehicles are suitable for different types of ground, whereas ground suitable for a camel is unsuitable for a horse or mule and *vice versa*.

Consider, then, those areas where our army has been or may be called upon to wage what is called a "small war." In most cases the ground is suitable for mechanical transport, which, acting in combination with aircraft and assisted by wireless, will simplify the tasks which in earlier days presented such formidable problems to our commanders. Take, for instance, the operations for the relief of Gordon, in 1884-85; it requires little imagination to visualize the influence which wireless, or even a few aeroplanes and armoured cars would have had on Lord Wolseley's plans. The experiences of the French, Spanish and Italian forces acting in North Africa, as well as those of our own in Irak, Palestine and elsewhere are sufficient proof of the efficacy of mechanical vehicles, acting with aircraft, over suitable ground against such an adversary.

Again, take a campaign such as we fought in 1899-1902, where the open veldt allowed movement practically everywhere, where rivers were few, and where rocky areas were clearly defined. The mobility of the Boers enabled them to carry on the war for nearly three years. Such ground would have been ideal for mechanical forces, whose mobility for limited periods combined with aircraft and wireless must have tended to shorten the campaign, even though the Boers had been in possession of such modern means of waging war as well.

The conditions of ground which affect the use of tanks and armoured vehicles are particularly marked in that portion of the globe which has been the scene of many of our "small wars," namely, the North-West frontier of India. Here for many miles the country consists of a succession of mountain ranges declining to rugged precipitous ridges separated by deep narrow valleys. The only possible routes lie along these valleys, which are left on occasion to surmount some steep pass. The routes are

mere tracks or river beds, and it is clear that on such ground the enemy has full scope for his harassing tactics. The movement of infantry up the steep slopes is slow, and atmospherical and geographical conditions render the task of aircraft difficult ; moreover, landing grounds are few. Such an area presents few opportunities for the use of track vehicles.

Fortunately the above description does not apply to the whole frontier, which may be divided topographically into two zones separated by the River Zhob. North of this line the use of tanks and track vehicles will be very limited, but south and west of Quetta the country is generally suited to the movement of mechanical vehicles. The degree of mobility which may be expected from mechanized forces has been well defined by saying that ground suitable for horse transport is suitable for mechanical transport, whereas ground requiring the use of pack animals is not suitable.

The hard rocky ground of North Persia, as well as that of other parts of Central Asia make these theatres unsuitable for the use of mechanical transport on a large scale ; the paddy fields of China and certain parts of East Africa present many difficulties in the way of its employment. In bush country, aircraft will have difficulty in locating not only the enemy, but also the column with which they are working, and tanks and armoured cars will be unable to act effectively owing to the trees and the absence of tracks.

It is interesting to speculate whether the progress of invention will always be of advantage to a disciplined force when dealing with an irregular enemy. In the past in open country, a badly-armed enemy has had but little chance against regular troops, but in thick or broken country superior activity and knowledge of the country have made him a formidable foe. Unfortunately in this latter type of country, neither aircraft nor mechanical vehicles are able to operate to the best advantage. The characteristics of an enemy of this type have in the past tended to compel a regular force to adopt a close-order formation, not only for the protection of its transport but also for the development of a sustained fire in all directions. With modern firearms in the possession of the enemy, such a formation has pronounced drawbacks, and with the possibility of the enemy using even a few aeroplanes these drawbacks will increase. The desert square has fulfilled its function, and a study of the recent operations by the French in Morocco shows how a more elastic formation is to be preferred. Is the perimeter camp still the most suitable form of defence, if the frontier tribesmen can beg, or borrow a few guns or obtain an aeroplane or two ?

New methods will be evolved, but whatever the size of the forces engaged, the nature of our enemy or the means of waging war placed at

our disposal, the effect of ground remains predominant. I will close by quoting from the memorandum on last year's individual training, which says: "The feature in peace training which is real is ground. Training in the use of ground is an essential in all tactical training. Ground is a reality and forms the basis of all our exercises."

DISCUSSION.

GENERAL SIR GEORGE BARROW: General Deedes has alluded to Lord Allenby's operations in Palestine. On one occasion he said: "Would it have been a suitable or feasible operation for a mechanical force to have undertaken what the cavalry did during Lord Allenby's final round up?" I happened to be in that final round up and I should therefore like to express my opinion. It might have been possible for a mechanical force, but they certainly would not have had as good a chance of succeeding as the cavalry, for this reason. We went up by night through the Musmus Pass, a little to the right of the pass which Napoleon took when he went up to Acre. My great anxiety the whole time was that I expected every moment to find the Pass held by Turkish and German machine guns. It is a narrow Pass, with hills on each side, and three or four sections of machine guns could have delayed us considerably. It was all a question of getting to our destination as quickly as possible, because if we were not in time a great many of the fruits of victory would be lost. As it happened we got through just in time, and found the German and Turkish machine guns rushing up to hold the Pass, as I was so afraid they would do. When we arrived at Megiddo at daybreak we saw them hurrying across the Plain of Esdraelon. Our advanced guard went straight for them with the lance, and knocked them all out, practically without any loss to ourselves. So far as the enemy was concerned, the whole lot were killed, wounded or captured. If the Pass had been held by machine guns we should have been delayed but we could have got round. We had a whole division of cavalry; we had three batteries of horse artillery and our own machine guns, and we could have turned the enemy force out, although we should have been delayed. It is doubtful whether a mechanized force could have knocked out those machine guns if they had been well placed and sited. It would have taken a very great number of mechanized machines in order to provide enough men who could have fought on foot and turned the flanks. Moreover, it is reasonable to suppose that if they had thought a force was coming that way the Turks and Germans would have mined the roads, which was an easy thing to do, or blocked them. It would have taken very little to arrest or completely stop a mechanized force for an indefinite length of time. There is one thing I have noticed which has struck me greatly in many of the documents and papers I have read lately about the employment of mechanized forces. They so often talk of how we are going to use our mechanized forces, and as if the other side had not got one and was never going to have one. I have read in the pages of our JOURNAL—I think it was—a remark made by a well-known officer to the effect that if Wellington had had a mechanized force at Waterloo he would have knocked out the French in half-an-hour. But is it reasonable to suppose that, if Wellington had had a mechanized force at Waterloo, Napoleon would only have had the old Brown Bess, or the French equivalent of it—I believe it was earlier than that—and old muzzle loading guns and people fighting in their cuirasses with swords? That is not a reasonable argument in any way; and that is why General Deedes' lecture

to-day has been such a sound one ; because he has taken a reasoned view of what the infantry can do in the face of mechanized forces and what the mechanized forces can do.

LIEUT.-GENERAL SIR W. HASTINGS ANDERSON : There are three points to which I should like to draw attention upon which I hope we may shortly hear some opinions. I speak as one of those who are interested in administration.

Every time I leave the War Office the problem of mechanical transport for the supply of forces in the field comes before my mind. In proceeding to my destination I can either go on foot or in a car. If I go on foot and proceed to the places marked with a board " Please cross here," I find that it is quite impossible to do so owing to the continuous stream of traffic that is passing. That brings out the difficulty of maintaining an even flow of traffic for the wants of the mechanical forces to which the lecturer has referred ; and it brings out the possibilities that such concentrations of transport as we see in the neighbourhood of Piccadilly Circus and other places would offer to our friends of the Air Force. The other way for me to proceed to my destination is to get into one of the swiftly moving taxis in order to get there quickly, only to find at the end that I have taken a quarter of an hour longer than if I had walked. That emphasises the difficulty in future wars of making administrative arrangements for bringing up to the front the vast requirements of large armies. It is not easy to make administrative arrangements for that flow of traffic. The more mobile our forces become the more our difficulties increase. You may have to double the personnel because that personnel is not able to work up to the efficiency of the machine. The quicker the possibilities of individual movement, the slower may be the total movement on account of the trouble experienced in obtaining an even flow due to any sort of obstruction.

I would ask those present to consider two other points. The lecturer gave us to understand I think that, from the infantry point of view, we should avoid the higher ranges and keep to the low ground. We all know how necessary it is for infantry to avoid those " pleasing prospects." There are other arms to which those prospects are possibly of more importance than they are to the infantry ; and I cannot be quite sure that we shall not be obliged, speaking as infantry soldiers, to fight for observation posts in the future, as in the past, because in spite of observation from the air our friends the artillery will still want us to obtain for them places from which observation may be gained for artillery fire. I ask for guidance on that point from some of the officers present. The third point is this. Two years ago I was on manœuvres near Quetta and a somewhat difficult question arose of how we were to have a perimeter camp in the evening in view of the fact that the enemy possessed modern arms of precision and an air force as well as tribal levies : I am disappointed to find that two years later General Deedes asks the same question, but does not answer it. Is it a question of making very small perimeter camps so as to avoid hostile artillery and as far as possible a hostile air force, or must we adopt more civilised methods of locations at night, widely dispersed ; in which case there is very little question that the drivers of vehicles who have been at work all day will not get much sleep at night. There is the question of our rest being constantly harried by the lighter forces of less civilised nations against which we may be fighting. In any case, the question of the perimeter camp, which we have always accepted as a means of obtaining sleep for the greater part of our forces and a reduction of the number of troops on duty at night, changes completely if the enemy is not merely going to snipe into the camp occasionally but may be able to fly over it in his aeroplanes or use long

range firing into the crowd which a perimeter camp entails. I would gladly ask for guidance on those points, and I hope the lecturer may tell us whether he has been able to formulate any views thereon with regard to the Field Service Regulations.

GENERAL E. H. WILLIS: As the Quartermaster-General has just remarked, the artillery requires the high ground for observation. At the moment we are handicapped in this way. Though it is possible to drag the guns by machines over the low ground and up most of the nullahs in the North West Frontier area, we cannot replace the horse altogether.

No machine has yet been invented that can carry the battery staff up the precipitous hills on top of which the best O.P.s. are situated. It is a case of either walking or riding and the former method is too slow.

LIEUT.-COLONEL E. F. GIFFARD: General Anderson asked a question with regard to the perimeter camp, in regard to which I had some experience in East Africa.

We started with very large perimeter camps holding possibly as many as three battalions, but we found that if they were attacked by the Germans by night or day we could never get out of them as they were an ideal target for artillery and aeroplanes. We came to the conclusion that whatever the size of the force, it was much sounder to divide it among small perimeter camps. If we had a battalion we used to divide it among several perimeter camps, a company being in each; one of them, possibly the rearmost company, looking after the carrier transport and the baggage, the other three having with them only the carriers required for Lewis and Vickers guns. We discovered also it was best to do the same thing when we had larger formations of two or three battalions, each battalion being in one or more camps.

GROUP-CAPTAIN E. L. GOSSAGE: I would refer to the remarks made by General Sir George Barrow in which he took the operations of Lord Allenby in Palestine as an example. I think it is now generally admitted—it appears also in the Regulations—that victory is not won in these days by the infantry but by the co-operation of all arms; and it is very necessary to employ each arm on the ground and in the way best suited to its characteristics. I think Lord Allenby's operations in Palestine offer an excellent example of the complementary part which can be played by aircraft on occasions, provided you can select the proper piece of ground in which to call upon the Air Force to play its part.

After the advance had been launched and the Turkish Seventh Army was in full retreat, there was one way of escape over the River Jordan left open to them. It was necessary to block this way of escape until the cavalry came up to complete the capture of the Turkish Seventh Army. This resulted in the bombing by the Air Force of the Wadi Fara Gorge, which lies just to the north or north-east of Nablus. The effect of this bombing was to throw the retreating Turkish Seventh Army into complete confusion. It brought their retreat to a standstill and resulted in the cavalry coming up and completing their capture. I think one may regard this as a classical example of how the Air Force, if properly handled and applied to the proper nature of ground, can play its part in co-operation with other arms in securing a victory.

THE LECTURER.

MAJOR-GENERAL C. P. DEEDES, in reply: There are only two points which require any reply. First with regard to the Quartermaster-General's remarks

about fighting for observation, it was certainly a mistake on my part to lead anyone to suppose that that would not be the case. What I intended was that, although we shall have to fight for observation for the gunners, it does not necessarily mean that infantry units will go and put themselves up on the high ground where the gunner O.P.s. are, but will rather seek the lower and less conspicuous portions of the front which will enable them to escape the observation of the enemy and at the same time protect the eyes of the artillery.

As regards perimeter camps I am afraid I am unable to add anything to what Lieut.-Colonel Giffard said regarding small perimeter camps, which I think is the best solution for the moment.

THE CHAIRMAN.

I would like to add a few remarks on General Deedes' paper. Taking the first tactical question, namely, that infantry would probably now seek close ground. This was brought out very plainly in the training in Sussex this year; and I think I am voicing practically all those who took part in those manoeuvres in saying that they were the nearest thing to war that we had seen during training; it was so certainly in my experience. Sussex is not an "18-pounder" country (I speak under correction); it is not a machine gun country; and it is not a tank country; it is an infantry country, especially if well backed up by light artillery and assisted by what I may call the "intimate" ground reconnaissance by cavalry. I think the way the infantry got to work after a very short time in that close country, in co-operation with the light artillery, was an extraordinary advance on anything in infantry operations that I have ever seen. The true difficulty is for commanders to make a fire plan. Now in that sort of country, a fire plan is of paramount importance in any operation. This seems to be the reason why we have always tried to go round in preference of through forests and woods, because of the difficulty of making a fire plan and of co-operation in case anything unforeseen occurred which was hidden from our view. I take it that reconnaissance, especially with anything in the nature of an armoured force, will be even more important than it has been. Instead of saying that "time spent in reconnaissance will rarely be wasted," we shall be saying that time will never be wasted under those circumstances. One must make an absolute certainty of one's blow; one must have a "sitter" before one attacks an enemy armoured force with one's own armoured force. We must be perfectly certain that he is "there," and that we can get at him over the intervening ground, however far off he may be.

The lecturer raised the point of large armies cutting themselves adrift from the old elemental communications, harbours, roads, railways, mountain passes. I cannot myself visualise an army for any length of time cutting itself adrift in that way. I cannot even visualise it in a place like South Africa, where one can go practically everywhere. I think the question of repair and replacement must come in. As long as we are ordinary mortals made of ordinary, some of us very ordinary, flesh and blood, sooner or later, if we cut ourselves adrift in this way, we shall find ourselves agreeing with the sentiments of Mr. Jorrocks when he said: "'Evvens be praised! there's a gate and a lane too.'"

The customary votes of thanks, which were passed by acclamation, were then accorded to the Lecturer and to the Chairman, whereupon the meeting terminated.

THE TRAINING OF AN INFANTRY BATTALION

By LIEUT.-COLONEL W. N. NICHOLSON, C.M.G., D.S.O.,

The Suffolk Regiment.

THERE is no golden solution that will meet the training problems of any and every battalion; each battalion commander must fit his own programme to meet his special needs, and until he has a thorough knowledge of what these needs are the fit cannot be guaranteed. "Time spent in reconnaissance is seldom wasted" is peculiarly true when applied to this problem. We are apt to forget that hoary custom rules every battalion; that it is but a step from the spit and polish days when drill was the beginning and the end of everything; that musketry is but a modern innovation. Our own minds may be stuffed with higher tactics and we therefore do not realize that the rank and file are still at the beginning.

The aim of every battalion commander must therefore be to strike the happy mean in his training programme. To take into account the various idiosyncrasies of his unit (due to its past history) and to frame that programme to suit the actual demands of modern standards of efficiency; to give it an upward lift on the comparatively unknown tactical road, a road that is at present signposted with shibboleths such as "fire and movement" "fire-plan" and the like.

THE PRESENT STANDARD.

What standard has his battalion reached? That is the first question a battalion commander asks himself. That is why he keeps a training diary, by which he can check errors and omissions and make fresh advances.

He has no difficulty in gauging the standard of musketry and drill—weapon training and physical efficiency as they are called to-day—and framing his plan accordingly. These can be classified as exact sciences, for, given the right teaching and allowing the right time, a constant result can be expected. There is a rule and a regulation to meet each requirement, and the rank and file have been brought up for generations on rules and regulations. But there is no fixed and invariable rule for a tactical problem and that is why the rank and file break their heads over tactics. In their judgment there are dozens of answers to thousands of problems.

A battalion commander fills his training diary with tactical memoranda in his endeavour to fix this standard. The mistake that most of us make is that we fill our notes too full of such details and try to include too many in our programme. At first we take note of every mistake we see, and we underline the criticisms of those in authority on the mistakes they have seen, though these latter are rarely more than one in a thousand of the mistakes made daily. Elementary mistakes will be made till the crack of doom. Do not look for them, look for good work; not accidental good work but reasoned good work, then you will know the standard you have attained. A training diary that has been restricted to good deeds may look a trifle thin but will be of the greatest value.

THE COMMANDING OFFICER'S TASK.

In peace the practical duty of training is more important than the problematical art of leading. In war it may be sufficient to lead what others have trained; but in peace the first duty of a commanding officer is to train his unit, his second duty to lead it.

The talkative young officer in mess sets an object lesson in tactical training. He is not necessarily the most knowledgeable but he always provokes a discussion which serves to sharpen other men's wits. Discussions can be fostered by arranging that all work is done in syndicates. Once start the ball rolling and the intelligent will teach the dull; the aspirants for the Staff College will advocate the new idea; senior officers, the old, one and all, will learn. Another rule is that all possible tactical training should be done on the ground. A tactical exercise on the ground is worth two of any equivalent in barracks. The sand model is an excellent substitute when the weather is bad, but it is a long way short of the real thing. Every accidental feature on the ground will teach a fresh lesson, for no two areas are the same. But on a sand model the hedges and ditches are always imaginary. The actual ground is even more important for training the N.C.O. The officer working on a sand model may believe that the little bit of greenery and the mound of sand really do represent green fields and hills; the N.C.O. emphatically does not. He knows better. He knows it is just talc and sand in a box made by the pioneer sergeant.

The value of discussion and the importance of going on to the ground are two of the chief planks on the commanding officer's platform. A third is the simplicity of his tactical programme. We are constantly enjoined to make one lesson the object of each tactical exercise; but it is even more important to stick at that lesson until it is learnt. Take one operation of war, say defence, as the subject of study for the year. Choose one or two special lessons for this operation. Frame a

simple scheme. Then work it out once a week on different ground, until something is really learnt. Make the battalion, with all its co-operating arms, the body of this scheme, discuss in all its details the action of the company, point the lessons for the platoon. In this way you frame a picture for the training of the whole battalion. Lastly, fix some minimum standard to be attained, such as fire control by the section leader, an eye for ground by the platoon commander, orders by the junior officer.

THE TRAINING OF THE OFFICER.

No commanding officer is a schoolmaster. If he were he would make a most unsuitable commanding officer. Neither does the present-day regimental officer bear any relation to a schoolboy. For if he intends to learn only what he is obliged to by his seniors then he had better try some other profession more suited to his sleeping talent. The modern regimental officer is a professional soldier. Schools of instruction, courses, and examinations have no doubt helped to shape him; to-day he is interested in all that affects his profession. The training of the officer is not therefore an unpleasant duty, but it does entail a great deal of hard work, as the standard to attain is high.

Only a brief reference is necessary to the training of officers in drill, musketry and the many other subsidiary subjects. What the battalion cannot, schools of instruction can accomplish and, provided the young officer on his return to his unit is made to teach what he has been taught, and subsequently to keep himself up to date, his education in these matters may be considered complete. Preparation of young officers for promotion examinations gives the commanding officer rather more anxiety; but if his tactical and administrative programme is thorough this should fit them for promotion. Special classes should not be necessary, though military law is perhaps an exception to this general rule. It is not promotion examinations or instruction in musketry or drill that occupies the mind of the battalion commander, but the tactical training of his regimental officers, their training as a team. His chief consideration is to draw up a programme that will include all officers and selected senior N.C.O's and will form a model for the remainder.

On first consideration two tactical programmes seem necessary; a higher standard to suit the senior officers, those who have qualified at the Staff College and those on the Staff College list; and a lower standard for junior officers and N.C.O's. But in actual practice it is soon proved that all must work together. However capable the senior officer, there is still much for him to learn in the handling of a company and a battalion. However inexperienced the junior officer, he is never too young to begin the study of higher tactics. Frame a programme suitable for junior officers and it will soon be apparent that the seniors

can be fully occupied on it to their advantage. Fill in the spare time with lectures and discussions on other arms and other operations by selected officers and all will learn.

The tactical exercise without troops held in the country is the best possible individual training. Make it a fixed rule that one day a week is invariably set aside for this tactical exercise, and that every available officer and some selected N.C.O's always attend. We are apt to decry the English winter weather but in practice it rarely interferes with this one day. It is all important to do this work on the ground and only the preliminary writing in barracks. Arrange that successive exercises deal with only one operation of war and don't attempt more than one or two special lessons. Then at the end of the training season you may be sure something has not only been learnt but will be remembered.

In addition to tactical exercises without troops, commanding officers are instructed to set essays and to study a specially selected campaign. Many young officers are prejudiced against the study of military history. What can the campaigns and battles of Wellington and Napoleon teach us, they say, in these days of tanks and aeroplanes. The study of military history will teach them nothing of value unless they discover the lessons which can be learnt by a comparison of the conditions then and now. A lecture that deals with the facts of a campaign or a battle and omits the moral is almost valueless, for the secret of all training is to emphasize a lesson.

The sand table is of real use to illustrate military history by staging a battle, or a portion of a battle. Salamanca, or Waterloo, shown on a carefully constructed sand model is not easily forgotten; the movement of the troops, the features of the ground all fix themselves in the memory. If each syndicate is allotted a phase in the selected campaign, one officer can describe the incidents that lead up to the battle, another the action itself, and a third can start the discussion by comparing certain phases with modern conditions.

Every commanding officer who reads through tactical schemes of at least some of his junior officers will endorse the selection of essay writing as a matter for training. It is not suggested as a polite accomplishment. It is a real need. It is the first requisite for anyone who wishes to pass examinations with credit, though these are only a means to an end. To write a good, or even a tolerably good, military essay, you must be logical; and logic is the essence of a good military plan.

An appreciation is the best model for a military essay. A soldier who has once learnt to write good appreciations can tackle any non-military subject. His style will be crisp and clear and his conclusions will be firm. The habit of appreciating a situation should be automatic;

the junior officer cannot have too much practice. He should be continually writing or dictating them, he will then be schooling himself in weighing all the possibilities, in choosing the best solution, and in issuing clear orders. The selection of a special subject for an essay may make him read but cannot teach him to write. Short orders, short appreciations, short memoranda on battle situations all aiming at a logical line of thought are of more value than one long essay.

When the lessons to be taught have been selected, a winter programme for the training of officers should include, therefore, one weekly tactical exercise on the ground; periodical lectures on selected subjects by selected officers; periodical lectures by syndicates of company officers on military history; the writing of appreciations and orders.

Now is this training sufficient? It must not be forgotten that it covers only part of the regimental officer's time; for the officer in addition to being taught has much to learn and much to teach.

There is a limit to the time the commanding officer can devote to the training of his officers. He may or may not have assistants; senior officers with a home battalion are often as rare as strawberries at Christmas. In any case the weekly exercise will take him two days, and it is therefore fair to say that both the instructors and the instructed are fully occupied on tactical training for at least two days in the winter.

It is a good plan to set aside a week or a fortnight at the end of individual training, in order that the lessons learnt can be recapitulated and discussed.

THE TRAINING OF THE N.C.O.

The present day N.C.O. is first-class material. As an instructor he is far ahead of pre-war days. But the basic difference between the officer and the N.C.O. is that the former can learn for himself while the latter expects to be taught. He can and does learn his drill and musketry from his book; but he feels that he is sailing on a very treacherous sea when he embarks on *Infantry Training*, Vol. II. He has great confidence in certain officers, and behold, they differ in opinion on what to him should be a point of fact.

There is a great difference in the standards to be attained by the officer and the N.C.O. The officer must become a tactical expert; he learns the groundwork of soldiering and then devotes himself to improving his knowledge of war. The N.C.O. must remain an expert in the groundwork in order to train the private. The exceptional N.C.O. may find the proverbial Field-Marshal's baton in his knapsack. He has a first-class chance of rising to-day, but he has much further to go.

The outline of training for the N.C.O. differs therefore from that adopted for the officer. Drill, musketry and all the complementary arts take a foremost place. Every senior N.C.O. should undergo an annual refresher course of a fortnight in weapon training with the battalion cadre, selected junior N.C.O.'s a six weeks' course. These and other special battalion courses in drill and physical training will leave very little time over for tactics unless every opportunity is taken.

A tactical foundation was laid when section leaders' courses were held in a battalion school, and this arrangement was at its best when the young N.C.O. went direct from this course to another held by his company commander. A uniform battalion standard was thus assured. These battalion courses are out of fashion, and instruction by the company commander is therefore essential. Elementary training is arranged; but what about the platoon leader and his instruction? The very brief period of company and battalion training is quite insufficient to make any N.C.O. an efficient platoon leader. He will learn next to nothing during them unless he has been taught during the rest of the year. It is therefore most important that all available senior N.C.O.'s should accompany officers on their weekly battalion tactical exercises without troops and that special company tactical exercises without troops should be periodically arranged.

TRAINING OF OTHER RANKS.

It is a popular belief that old soldiers never die but simply fade away. It is an unpopular fact that this fading away is an attribute of the young soldier serving at home. Signallers and machine gunners, transport and employed men, fatigues and the like, have a magical effect on their bodies between meals during the winter season. The company commander sees them on pay-days but seldom at any other time, yet he is responsible for their individual training. There are the best possible reasons for their absence, and their absence need not be regretted provided they are well employed. It is always possible to collect either the very good or the very bad, and provided the battalion net is set to catch them the physical training of all can be ensured.

The average home battalion is a sorry sight on manœuvres, the platoon is no more than a patrol, the section leader is sometimes the section. But if the officer and the N.C.O. are proportionately better trained then all is well.

NAVAL BASES AND SEA POWER

BY CAPTAIN C. J. C. LITTLE, C.B., A.D.C., R.N.

(Director of the Royal Naval Staff College).

(The following article is part of a lecture delivered by Captain Little to the London University in October, 1928. It is much regretted that considerations of space preclude publishing the whole of it—EDITOR).

NAVAL bases are liable to be placed in a defensive category in their relation to sea warfare. There is a tendency to regard them as being merely harbours of refuge, for retreat, etc.; but on closer examination it is evident that the reverse is the case and that, by increasing the mobility of the fleet, bases serve to increase the offensive power of the ships and therefore can justly be said to contribute towards that important principle of war, "offensive strategy."

There are two other accepted principles of war involved in the consideration of bases. First the principle of "economy of force," that is to say, to economise strength while causing a dissipation of that of the enemy; this involves the correct distribution of our forces and it is easy to see how bases, in correct strategical positions, enable us to employ the least force and at the same time be superior to the enemy in that area. Without sufficient bases naval strength would be dissipated and used up uneconomically in constant reliefs, etc.

The other principle is that of "security." The naval base allows the fleet to exert its offensive power and acts as a "security for that offensive." The offensive power of the fleet, sustained as it is by the fleet base, is employed to achieve the destruction or neutralisation of enemy forces and so, indirectly, the base furthers Government policy directed to secure trade and overseas possessions.

It is clear, however, that a base is incapable of taking part in this rôle without the fleet. It is sometimes said that a base "commands" such and such a position, that "Gibraltar commands the Straits," that "Louisburg commands the St. Lawrence." In effect, no base commands a position unless its guns carry across the navigable water as the forts at the Dardanelles did across the Narrows. A base such as Gibraltar

or Louisburg is similar to a police station, and like a police station is of no value without the police force. It is the force that commands and not the station.

An historical instance of the uselessness of bases without sea power may be found in the seizure of Malta and Egypt by Napoleon. Malta is perhaps the greatest of the Mediterranean strategic positions, but having only scant resources, its utility is measured by the power of the fleet it serves. Its fate when in the hands of France is a warning that the fleet depends less on Malta than Malta on the fleet.

Napoleon's policy of Eastern conquest, with his consequent expedition to Egypt in 1798 was conceived too late. France had used up the major portion of her power in her continental adventures and was unable to oppose British sea power which stood in her path. Napoleon abandoned the correct strategy of first destroying the British fleet and consequently the battle of the Nile sealed the fate of his project.

Again in the Russo-Japanese War, Japan had secured her foothold in Manchuria and Korea and had seized Port Arthur as the French had Egypt and Malta. But the ultimate fate of her new possessions lay in the defeat of Rozhdestvensky's fleet by Togo as that of France did by the defeat of Bruey's by Nelson.

REQUIREMENTS OF A BASE.

The continued prosecution of a naval campaign depends upon the integrity of the bases, and freedom of operation on the proximity of bases to the theatre of war. From one point of view, indeed, bases form the centre of gravity of a campaign.

Strategists have laid down three tests for a naval base and I do not see that we can quarrel with them. They are :

1. *Position or Situation.*—This, it follows as a matter of common sense, is of prime importance. The position of the base must fit in with the strategic plan ; it must be adjacent to the area of operations. These positions lie in nearly all cases on the recognised sea routes. An example of an almost unparalleled strategic situation is Gibraltar. Here is a base at the very point where it is desired to have control. Communications between the fleet and its base can therefore be easily defended by the fleet itself without impairing its liberty of action in watching the Straits. Were the base at Lisbon, say, a greater force would be necessary for this service.

2. *Military Strength.*—The real safeguard for a base is the fleet which is based on it, but this fleet may of necessity be engaged elsewhere. The principal advantage of naval force is its mobility. A squadron

engaged here to-day may be required 300 or 400 miles away to-morrow, so naval commanders must not have their hands tied by having to consider the safety of a base to the detriment of the destruction of enemy forces.

Nelson expressed this maxim when he said: "the best defence for his Sicilian Majesty's Dominions," which were also his base at the time, "is to place myself alongside the French." Lord Keith, the Commander-in-Chief, on the other hand, spoke of being shackled with the defenceless island of Minorca.

If the enemy force can be removed or rendered impotent, success is insured for all other sea operations. In the absence of the fleet the base should be able to take care of itself for a reasonable period. Natural characteristics for defence therefore play an important part.

Gibraltar is the classic example of a base of great military strength in the days of muzzle loaders. You will remember the long sieges and dramatic reliefs by British squadrons. In the War of American Independence especially, British naval strength was below that of her enemies, and squadrons could not be spared to cope continually with the assailants of Gibraltar.

3. *Resources*.—The ideal base would be one which abounds in natural resources, both materials and victuals. Bases like Gibraltar or Malta can, if necessary, be stored up against an emergency. If the position is near a source of supply so much the better. For instance, Singapore is reasonably near to Australia and New Zealand for many supplies and need not rely entirely on Home products.

To the above we must add a further requirement, namely, that the base should be furnished with adequate facilities for the maintenance of a fleet. Docks of sufficient size for the naval force which it is contemplated will operate therefrom are a necessity. Especially is this the case to-day, when speed is such a vital matter and ships' under-water fittings are so comparatively complicated.

The requirements of a large fleet in regard to naval bases are, I think, best illustrated by reference to the British North Sea Bases in the late war. As you are aware, we had no base north of the Thames at the outbreak of war. A base in the Forth had been suggested by her late Majesty, Queen Victoria, as far back as 1855, *vis-à-vis* Russia and operations in the Baltic, as well as for encouraging naval recruiting in Scotland. The question was raised again by the Admiralty *vis-à-vis* Germany early in the present century, but nothing much was done till after 1910 and the Dockyard at Rosyth was not in use till 1916 to 1917.

To Lord Jellicoe fell the task of improvising bases for the Grand

Fleet. Eventually a protected fleet anchorage with a magnificent protected exercising area was adapted from the wonderful natural features of the Orkneys. Here all the floating craft for supplying the fleet were also assembled, some fifty ocean-going vessels, in addition to countless tugs and trawlers for fetching and carrying. There were also about eighty-five trawlers employed for defensive purposes. A floating dock for destroyers and submarines was supplied at a later date.

A dockyard capable of refitting a battleship was created at Invergordon, the large floating dock from Portsmouth being successfully towed there. A floating dock for cruisers was also provided at Invergordon in the early part of 1916.

Until the facilities of the dockyard at Rosyth were added to those at Invergordon, in 1916 and 1917, it was often necessary to send ships as far as the South coast, the best part of 1,000 miles, to refit or repair.

Our superiority in naval strength over the Germans in the early days of the war was not so great as it was later, and it must always be remembered, as pointed out by Lord Jellicoe in his book, that it was Germany's "selected moment and our average moment." Germany held the initiative in this respect and could rely on her whole force for any projected operation. The increased period of absence of ships refitting, due to the lack of a base complying with the requisites we have considered, must have caused some anxiety to the Commander-in-Chief.

The provision of a fleet base, such as Scapa, under the stress of war conditions was a notable feat; but where the strategical situation is sufficiently clear to warrant the expenditure, it is naturally advantageous to make the provision in peace.

An equipped base, with facilities for repairs and for the supply of victuals and stores from the shore, is an added unit of naval strength and tends to the economy of tonnage. The employment of ships on sedentary work, such as floating storehouses, blocking channels or for anti-submarine defences is unsound. The war taught us the necessity for studying economy in merchant tonnage. In April, 1916, we had 2,092 ships with a gross tonnage of 7,249,138 tons employed on military and naval services, leaving only two-thirds of our normal tonnage for the needs of the country in food and raw materials, and this at a time when all were subjected to war risks.

I have already referred to the geographical position being the principal factor in assessing the value of a base for offensive purposes. In the late war, Scapa Flow was an ideal position for controlling the northern exit to the North Sea. Here the Grand Fleet was in a good strategical position for bringing the High Sea Fleet to action if any move North

about against our Home terminals was attempted. Again, a large proportion of neutral trade to the Scandinavian countries, Holland and Denmark passed North of the British Isles. For the purpose of regulating and guarding this shipping the Orkneys and Shetlands provided good bases.

But, as Lord Jellicoe says in his "Grand Fleet, 1914-16": "The difficulties of intercepting the High Seas Fleet during coast raids and of dealing with landing raids covered by the High Seas Fleet were so considerable as to make it eminently desirable to base the whole fleet further South, if this were feasible." In due course the necessary defences were provided, and the fleet moved South to the Firth of Forth in 1917. The grip on the enemy was thereby tightened, only the S.E. part of the North Sea being left for him to operate in without the certainty of being brought to action by a superior force.

Later, in 1918, it became evident that the Germans contemplated interference with our Channel troop traffic, in order to assist their Armies, which were then being driven back on the Western Front. From the Forth it would have been difficult for our Fleet to have intercepted the High Seas Fleet engaged on such a raid. Proposals were therefore made to move the battle cruisers to the Thames Estuary and the battle fleet to the Humber. But the Mutiny at Kiel came before this was done.

These successive events illustrate the necessity of moving up to an advanced base as close to the enemy as possible when a strategy of neutralizing him is being followed. This may be especially necessary at a critical period of a war. The covering fleet should be in a position where it can always threaten attack if the enemy puts to sea.

THE GREAT WAR.

Napoleon said that "war is a business of positions." There is no better example of this than the naval position in the late war. The strategical situation in 1914 can best be examined under two heads, the position at Home and the position in the Empire. At Home the position was, possibly, unique, and we must be careful that the advantages we derived from the geographical position of Germany and from the consequent commanding position of our fleet bases, does not lull us into any false sense of security. It is difficult to foresee a similar situation arising in any future war.

The British Isles lay athwart the German Sea approaches. The British fleet based on the East coast of Scotland and in the Channel, covered the exits to the North Sea and consequently Germany's sea communications with North and South America and with her Colonies. On account of the dominant position which the British bases gave to

our Navy, Germany could not threaten our lines of communication overseas without first destroying our fleet.

Compare this position with that of France in the wars of the XVIIIth century. The British bases at Torbay and Plymouth "covered" the great French base at Brest, but it is easy to see that the geographical position was such that raiding forces against trade could often gain access to the open ocean by evading our forces on dark nights and in bad weather.

It is true that a serious threat did arise in the latter part of the late war, to our Home terminals, in the shape of the German submarines. This was on account of the power of the submarine to evade the British covering forces and attack the trade in rear of them. The reason this threat failed and must fail again under similar circumstances was, speaking very broadly, because the position of our bases relative to the terminals of the ocean routes, enabled us to exercise our sea power in the submarine area of operations. In other words, thanks to the position of our bases, our main fleet covered our anti-submarine forces from attack by the German High Seas Fleet and enabled those forces to operate in the best tactical manner in this favourable strategical position.

The submarines failed, as one believes they will fail again, unless supported by surface forces to dispute control of sea communications and threaten the anti-submarine opposing forces. The system of convoys which proved to be efficacious as regards attack from submarines was protected by the commanding position of the Grand Fleet from interference by German surface forces.

In the Empire overseas we found all the principal trade routes flanked by British bases, thanks to the wisdom of our predecessors. Our naval forces were thus enabled to operate at will in all the trade areas against the enemy ships. An area in which we were possibly poorly served for bases was on the East coast of South America. Here the only British possessions are the Falkland Islands, destined to play an immensely important part in the destruction of enemy cruisers, but badly situated so far as our all important trade to Brazil and the River Plate is concerned. However, this difficulty was surmounted by means of temporary bases, such as the Abrolhos Rocks and by coaling and provisioning our ships at anchor outside the three mile limit of territorial waters.

What was the result of this? German shipping all the world over, with the exception of the Baltic was obliged to put into harbour and remain there for fear of capture by British cruisers. British shipping, on the other hand, continued to sail, using the chain of British sea bases

What of the German naval forces abroad? German naval bases in

her African Colonies, such as they were, were ill placed for cruiser operations against British trade. Her base in Far Eastern waters at Tsing-tau, acquired in order to render Germany's naval forces independent of bases in the territory of Foreign Powers, was useless as its sea communications with Home were severed and could not be restored. You will remember that the German fleet actually abandoned Tsing-tau at the outbreak of war for fear of being located there and being brought to action by superior forces.

As a result of this lack of bases the German cruisers, ten in number, were obliged to lead a hand to mouth existence, finding their supplies from captured ships as opportunity offered and fleeing from the allied cruisers like hunted rabbits. In reviewing historical events, tribute should be paid to one's enemies where due, and I think that under the circumstances the Germans did well, especially in some notable cases such as the "Emden." All their scattered cruisers were not brought to book till early in 1915, and not before they had accounted for about sixty British merchant ships, aggregating about a quarter of a million tons. It may be that our plans for protection were not all they should have been at first or were not carried out in their entirety; this is outside the scope of this paper. Better might be done in future, but the fact remains and needs emphasis that even with our well chosen and numerous bases, superior cruiser forces are always necessary for the destruction of maulauding enemy vessels.

THE FUTURE.

In taking stock of the future we must not overlook the great work now being carried out in the establishment of the base at Singapore. Look at the strategic position of this place: a fleet based there covers India, the Malay States and other Colonies in the Indian Ocean, while it flanks the routes to Australia and New Zealand.

The island of Singapore was acquired by Sir Stamford Raffles from the Sultan of Johore in 1818. The East India Company were concerned about the safety of their trade to the East and wanted a base to maintain a squadron in these waters. The British flag was hoisted on 29th January, 1819, and Raffles wrote prophetically: "What Gibraltar is in the West that may Singapore become in the East." And again, "You may take my word for it, this is by far the most important station in the East and, as far as naval superiority and commercial interests are concerned, of much higher value than continents of territory."

Singapore lies outside the area defined at Washington in which the "*status quo*" is to be maintained. It is some 3,000 miles from the Japanese Islands. It is clear, therefore, that the base can offer no

threat to anybody. Modern steam fleets cannot operate at distances of 3,000 miles from a base, the establishment of the naval facilities at Singapore is merely a continuation of our well-considered policy of "security."

In considering the future at sea one must not overlook the effect of air power. The advent of the aeroplane has made a profound and world-wide impression on existing means of communication and transport. On sea power the impression has hardly been less. The Navy fully appreciates the tactical advantages that accrue from the extended powers of reconnaissance which the aeroplane gives. Seaborne aircraft have become an integral arm of the fleet. But so far as naval bases are concerned, little effect is discernable, except where they are within range of enemy shore-based aircraft.

The small radius of action of aeroplanes ties them to bases to a much greater extent than modern warships are tied, and for extended oceanic operations, aeroplanes are based on the fleet.

From a world-wide point of view the present naval situation is unique, and unlike any that has previously arisen. The three principal naval Powers are separated by thousands of miles of ocean, each secure in his own sphere; and that security stands on naval strength. The Pacific Four Power Pact secures the position of Japan in the Far East by agreement in regard to the strategic position. America is unassailable in her hemisphere and an observance of the Monroe Doctrine secures her from interference. We, with our disjointed Empire, lying between the two but remote from either, are secure by reason of this remoteness.

For security within the Empire against aggression we rely on our naval strength and chain of naval bases. Mahan has said: "By her very success, however, Great Britain in the vast increase and dispersion of her external interests has given hostages to fortune, which for mere defence impose upon her a great navy."

The recent Pact for the "Outlawry of War" has recognised the domestic nature of the "Right of Self Defence." The policy underlying Imperial Defence is purely defensive as the name implies; our political object is security.

An efficient defence necessitates readiness for energetic offensive measures. The naval base has been described as "the indispensable foundation upon which the superstructure of offence is raised."

The increased complexity of modern naval forces and their diminished "continuous mobility" have rendered bases more than pawns in the game and more than ever an element of naval strength to be attacked or defended, to be worn down or to be built up.

ORGANIZATION BY THREES

By BRIGADIER O. C. BORRETT, C.B., C.M.G., C.B.E., D.S.O., A.D.C.

WITH the organization of infantry battalions into three rifle companies and one machine gun company, the opportunity has arrived for putting forward an idea which is the result of my experiences of the Great War.

From the point of view of a regimental soldier there were two primary causes for our failures and, on occasions, limited successes in France; both causes were due to lack of depth. Our failures were often failures arising through the absence of troops to give the necessary impetus to the attack, with the result that the whole blow failed to penetrate the enemy guard. Another rapid blow would frequently have upset the enemy's balance; we would have delivered the knock-out blow in place of receiving it in the shape of a counter-attack. Those of us who were enabled to break through the enemy defence—and this break-through occurred on many occasions—will remember the despair in our hearts when we waited hour after hour for troops to arrive to exploit the success, only to see them arrive twenty-four hours or so too late and wither away in front of the enemy troops who by then had closed the gap.

The German attack in 1918 failed to gain its object for the same reason; inability to deliver a knock-out blow, due to reserves being so far back that we had time to recover our equilibrium before they arrived.

Depth is now insisted on as a matter of first importance, both in attack and defence, but even now depth is sacrificed to breadth. The majority of officers are unable to get away from a square formation, and, with four companies in a battalion almost invariably both attack and defend on a two-company front with two companies in reserve. The latest organization happily prohibits such a distribution and forces a battalion commander to abandon breadth and mass his attack in one or more localities on his front.

I now formulate the theory that an attack organized so as to deliver one smashing blow will never succeed; if organized to deliver two hard, shrewd blows, it will seldom succeed, whereas if organized to deliver

two such blows followed up by a rapid knock-out blow it will nearly always succeed.¹

It is recognised that on occasions a fourth or fifth blow may be required, but the depth in which any one unit can manœuvre and work is subject to limitation, and if we accept the formula, "one never, two seldom, three always," the occasions on which even more depth is required can best be arranged for by the deployment of another complete unit also in depth.

I therefore consider that, as a general rule, a battalion should attack on a one-company front in three-company depth; not along the whole battalion frontage, but massed against the point or feature of most value. There are, of course, many alternatives such as when it is desired to make a demonstration against one feature while attacking another, but as this demonstration must be pushed home as opportunity offers, it must also be deployed in depth.

In mobile warfare there are many occasions on which companies and platoons will be expected to push aside opposition, such as in advanced guard work, patrolling, etc., and it is as necessary for companies and platoons to be imbued with the spirit of depth as it is for higher formations. Companies and platoons must therefore move in depth, and the same "figure 3" applies to their depth, as to that of battalions. There should, therefore, be three platoons to a company and three sections to a platoon.

As regards defence and outposts, all our text-books insist on a three unit depth. With four companies a battalion is nearly always deployed two and two, a separate formation providing the third unit of depth. This was unsound as it did not enable a battalion commander to arrange for a strong immediate counter-attack. With the three company organization, depth is provided automatically.

Now as in the higher commands depth is as equally important as in battalions and platoons, it would appear that a brigade should consist of three battalions and a division of nine or eighteen battalions. But

¹ Before the Great War, although believing in attacking at all costs, the French relied upon formation in depth for defence; the Germans, on the other hand, preferred to strengthen their front line at the expense of their reserves, both in attack and defence. The severe losses incurred by the Germans in their attacks at Ypres at the end of 1914 induced them to modify their tactical methods. In the early fighting in Champagne (March, 1915) they had begun to organize their defence in three lines to repel the French attacks. Their success in that fighting, combined at the same moment with their experience at Neuve Chapelle, where a single defence line was run over by the British attack, led more and more to "fighting in depth," and tactical methods were universally modified on that basis.—EDITOR.

this is not quite the case. A brigade is only a convenient fighting formation ; in a war of any magnitude the division is the smallest unit. Moreover, the divisional commander is the most subordinate commander who has a right to acknowledge a failure or order the fight to be broken off. All other commanders must push a fight to the limit of endurance of their troops. It is correct for any commander subordinate to a divisional commander to deploy all his troops and arrange for the use of his reserves ; there will be little scope, if any, for manoeuvre within a division, and for junior commanders to use reserves to provide impetus is the correct use of them, and is not, as is popularly supposed, the reinforcing of a failure. No failure exists until the divisional commander has accepted it as such.

The necessary impetus to the attack must be given by the continued application of pressure from behind. If the enemy is able to interfere seriously with this pressure by concentrating artillery on it, the main attack has started before the fire fight has been won, which is bad generalship.

As the division is the unit, it is the smallest formation which is justified in keeping a proportion of troops out of a fight, that is, troops to push in at the psychological moment at the critical point, a formed body to exploit a success, or on which to re-form in case of failure. The division therefore should be composed of twelve battalions ; nine battalions deployed for attack and three as reserve. Unless this reserve is provided automatically there is the danger of forming it out of battalions providing the requisite attacking depth. The deployment would be in varied depth ; against very strong positions there might well be a three-battalion depth, whereas against lesser features one in depth would suffice. The divisional commander must increase his reserve if he does not require as many as nine battalions for attack, but the corps commander should allot frontages to divisions according to the strength of the enemy position calculating on a normal deployment of nine battalions. Two essential duties of the divisional commander are : (a) to represent the matter if the frontage allotted is so great as to force him to sacrifice the depth he considers necessary at all points ; and (b) to deploy sufficient strength in depth at the outset as to ensure success.

It is recognised that this organization of three attacking brigades and one reserve brigade, each of three battalions, in place of the present three brigades of four battalions, will increase the number of brigade commanders and staff officers. But it must also be recognised that with the increased fire power given us by the additional machine guns, and with the addition of mechanical vehicles—at all events for the reserve brigade, it will be necessary to reduce the size of commands, if the

essential factor of time is not to be sacrificed to the co-ordination of an unwieldy number of weapons.

Co-ordination of all arms must be effected in the encounter battle with the utmost speed as all opportunities will be of a fleeting duration. Co-ordination becomes automatic on a comparatively narrow front when given sufficient arms of all natures deployed in depth. Moreover, the rapid employment of three battalions will often effect a result impossible of attainment by the deliberate use of a larger number of units. Time taken to co-ordinate an attack on a front of a breadth of $2x$ yards is more than double that taken on a front of x yards.

As regards artillery, field artillery has again been placed on a 6-gun basis. It has always been difficult in the advance to echelon four-gun batteries so as to keep some guns in action to cover the infantry, but in the withdrawal it has been impossible without arranging for periodical halts. The further the withdrawal, the shorter become the battery bounds until finally the infantry has to halt to let the guns get away. The same applies to machine guns, and in order to operate them efficiently sections should consist of six guns; i.e., three pairs of guns, and the machine gun company will comprise eighteen guns. It would be wise to organize the machine gun company into three machine gun platoons (each three pairs of guns) of three sections.

In these days of mechanical transport, when a battalion of infantry is marching it is to be expected that mechanized guns, machine guns in lorries, staff officers in cars, etc., etc., will be continually passing up and down the column. There are few roads in England or on the Continent of Europe where infantry in fours are not greatly inconvenienced by passing motor vehicles. In France a large number of units adopted the procedure of marching in threes and derived much benefit from it. It is therefore recommended that infantry should march in threes on a road, the steady move forward and lack of blocks compensating for the somewhat increased road space. But if infantry march in threes, they should fall in on parade in threes, i.e., in three lines. To move off they would right or left turn, and all the time spent in teaching recruits to form fours would be saved, to say nothing of the elimination of the heinous offence of forming fours in the wrong way when the rear rank is in front. A drill for troops in three ranks would be easy to devise, indeed the British Army has before now stood in that formation.

The underlying idea of this system is to accustom all commanders to soldier in depth, from the highest to the lowest; to cease thinking in squares and to become more elastic; to organize units in a convenient multiple of lesser units; and to enable us to eliminate from our parades and ceremonial a number of movements which are of no

use as battle drill. It is even suggested that a mass of soldiers in three ranks is more imposing than the same number in two, and ceremonial drill would gain equally with battle drill.

Although to anticipate criticism may be to weaken an argument, yet reference must be made to two probable criticisms.

It would be fair to say that the depth suggested is excessive and that on many occasions considerably less depth would be required to defeat the enemy. It is not, however, deploying unnecessary force to have a margin of safety, nor is it necessary to deploy all the units of depth at the same time. The idea carried to its logical conclusion facilitates carrying out the teaching that the attack should be delivered along a front by a series of columns of varying depth and at varying intervals.

It may appear that it advocates the massing of human beings in attack which in face of modern fire power has been proved to be not only ineffective but suicidal. This is not correct. What is really advocated is the employment of sufficient depth behind an attack to enable it to be carried through to a successful conclusion, instead of breaking down, as in the Great War, for want of sufficient backing.

Moreover, it is immaterial to the argument, whether the troops are (a) protected by armour ; (b) in, or assisted by, armoured vehicles ; (c) on horses or in aeroplanes. Indeed, aeroplane tactics are developed on formations of three and multiples of three. Consequently, I suggest that the number 3 is that on which all our tactics and organizations should be based ; the unit of whatever size or shape should consist of 3 of a kind ; platoons, battalions, machine guns, batteries, flights, tank sections, armoured cars, squadrons and all auxiliary services.

THE EMPLOYMENT AND DEVELOPMENT OF FLYING BOATS

By WING-COMMANDER R. B. MAYCOCK, O.B.E., R.A.F.

On Wednesday, 5th December, 1928, at 3 p.m.

VICE-ADMIRAL SIR H. W. RICHMOND, K.C.B., Commandant of the
Imperial Defence College, in the Chair.

THE CHAIRMAN introduced the Lecturer.

LECTURE.

IT is not my purpose to enlarge on the broad aspects of aviation, but to try to interest you in one type of aircraft which I firmly believe will take a position of primary importance in the future.

At the outset I should like to invite attention to an aspect of the subject with which my lecture is perhaps more directly concerned, and that is the safeguarding of the aerial tradeways over the sea from marauders and from organised attack.

In the past the protection of our imperial and international tradeways has been the responsibility of the Navy and Army and as the value and volume of the traffic grew these responsibilities increased in proportion. The inauguration of air routes, which will operate mainly outside the protective influence of these two Services will call for additional means, and as similar units are used for commerce or in attack or defence of it in their own particular sphere, it follows that aircraft specially designed for the purpose will be required. In this connection it may be noted that aircraft commenced their history in an opposite manner to that of units of the other Services. The latter began as commerce carriers and were evolved into fighting types, as warships for the Navy or mechanized forces for the Army. Aircraft on the other hand, were developed at first mainly for military purposes. This was undoubtedly due to the Great War, which intervened so early in their history. The flying boat was no exception to this and up to the last few years has been developed solely as a military aircraft for oversea reconnaissance and patrol.

To make clear the present day capabilities of flying boats and to leave you, I hope, as optimistically impressed with their future as I am, it is necessary to describe some of the more important stages of their development as a bare description of the capabilities and limitations of existing types is likely to be misleading. Moreover, within the last few years the advance in design and construction has been more rapid in this type of aircraft than in any other, and the improvements that have been made have a very important bearing on the developments we hope to see in the future.

TECHNICAL HISTORY.

The flying boat has been evolved in the process of producing an aeroplane that can safely fly off and alight on the water. Fundamentally it is an aeroplane, but instead of a fusilage and undercarriage it is fitted with a hull of sufficient buoyancy to support it when fully loaded on the water. The hull is provided with steps to facilitate hydroplaning when rising from the sea, and with a "V"-shaped bottom to soften the shock of landing. Until recently double bottoms were fitted, but these are being omitted in the new types with metal hulls, and bulkheads are taking their place.

The hull accommodates the crew and equipment and the necessary apparatus for operating the boat which is now a very considerable item. It must be a light, airworthy, strong and seaworthy structure, controllable in both elements. The designer is therefore faced with very complex difficulties in searching for the ideal compromise, but is not far short of it in the present size.

The aerostructure is saddled across the hull and the modern practice is to stow the petrol in tanks in the upper wings which minimises the risk of fire, provides gravity feed to the engines and leaves the hull free for accommodation and clear of petrol fumes.

The number of the crew required depends on the type of operation to be carried out. For Service purposes it is four or five for the class now in use, and six or seven for the larger classes under trial.

The first serious attempt to build a really seaworthy and useful flying boat in this country was made by the Admiralty at Felixstowe, then an R.N.A.S. Station, towards the end of 1916. A series known as the "F" type were produced and were very successfully used during the war, whilst "F.5", the last of the series, remained in service until the end of 1924. The speed and load they could carry, either in the shape of petrol or bombs, was, however, far below what the Admiralty then required, and their use was restricted to periods of moderately fine weather. At this stage it was thought that by considerably enlarging the size,

an increase in the load that could be carried and an improvement in seaworthiness would be effected. Consequently a number of new designs on a much larger scale were put down for construction. A few were tried out before the end of 1918, but with disappointing results.

At the end of the war there was a number of various types of large flying boats under construction, all of a very experimental nature, and for the next year or two work was continued on them. Eventually the best of them were sent on a trial cruise, together with a small one of the standard "F.5" type to obtain comparative data. As a result of this cruise it was decided to scrap these large types as they were found to be of a size far ahead of their time. We now know definitely that had those lines of development been continued, failure must have been the inevitable result.

A fresh start was made about the end of 1922 from the smallest size to which the then more advanced aeronautical science was applied. The policy needed courage, but has been amply justified as can be seen in the type in service to-day, which though half the cost, size and weight, can do double the work and very much more efficiently, a factor of the greatest importance when considering future improvements, for it has been found that it is by no means a *sine qua non* that mere size conduces towards the improvement of an aircraft's air or seaworthiness.

It requires little imagination to see how immensely valuable it would be if it were possible to construct a flying boat suitable for commercial use, which could equally well be used for military purposes. But such an aircraft, in addition to being able to lift the necessary load and transport it at the required speed, would have to be sufficiently seaworthy to enable it to rise from and alight in the harbours it used, in any weather. As it would be too large to be housed in the normal way, it must also be proof against the effects of weather for long periods. It must be capable, too, of economical operation and maintenance for either purpose and possess a reasonable margin of reliability in the air and on the sea if forced to descend.

Let me say at once we have not reached this ideal, nor is it yet in sight, but two milestones have been passed. These milestones represent the development which has taken place during two periods of time when the conditions under which the work was carried out and the aims we sought were widely different. The first period was from 1916 to 1924, during which the "F" series and certain larger experimental types, mainly on the same lines, were evolved and finally scrapped. The second period which overlapped the other, during which a start on new lines was made, began in 1922 and has produced boats of a design and construction bearing little resemblance to those of the earlier period and

with characteristics far nearer the ideal than previously achieved or, as far as we can see, could have been achieved.

Flying boats of the war period followed the normal practice for all aircraft of being housed in sheds or under some form of cover. Money being no object where operational success was at stake, large and expensive seaplane stations were built round our coasts before it was deemed possible for flying boats to operate from or in any particular locality. Well sheltered harbours were selected, and designers were asked to concentrate chiefly on improving speed, range, load and seaworthiness of an order that would permit of an increase in the number of days on which flying boats could be launched. A certain measure of success was achieved and some useful data collected, but they mainly went to prove how impossible it was to expect development on the prevailing lines. This, coupled with the closing down of the bases at the end of the war, very nearly brought about a complete cessation in the construction of this type of aircraft. Actually the policy of closing the bases and scrapping the large type boats which could not be used independently of them—though not an unanimous decision—was opportune, as it indicated more clearly than anything else could have done, that if the flying boat was to take a place in aviation it must be able to operate independently of fixed and elaborately equipped bases and be able to take full advantage of the many natural aerodromes every coast line affords.

Once this principle was established and acted upon, the flying boat developed on lines which have made it the most mobile unit in the Royal Air Force to-day. This entailed, however, a complete overhauling of designs as seaworthiness, maintenance on the water, and resistance to the effects of exposure to weather became of first importance; whilst these were being sought, performance took a second place. Now we can say they are all on a level and form an almost inseparable aeronautical problem on which the best aeronautical brains the world over are concentrated, recognising the potential value of this form of aircraft.

THE NEW ERA.

To show the advance that has been made, I will give you the performance figures and some details of the "F.5" and the "Southampton," the latter being the type in service to-day. The "F.5" had a maximum speed of 74 knots, a cruising speed of 58 knots and a range of 350 miles with 500 lbs. of bombs. It had a span of 102 feet and when fully loaded weighed about $5\frac{1}{2}$ tons. It possessed a certain degree of seaworthiness, but the relative weakness of its construction limited its use to fine weather, whilst exposure to weather entailed rapid deterioration. The type of

construction added to the difficulties of maintenance and at the same time provided but little space for the crew and equipment necessary for the operation and defence of the boat. Briefly, its poor performance, considered good at that time, its lack of robustness and seaworthiness and its dependence for maintenance on a base, restricted its operations to what, in these days, would be described as definitely local.

The "Southampton" succeeded the "F.5" at the end of 1925. It proved to be a remarkable production in that it combined the three main qualities aimed at with almost perfect balance for a boat of its size, viz., performance, seaworthiness and mobility. Moreover, it showed itself to be capable of considerable improvement in each of these directions, a great deal of which has already been realised, and from the data thus obtained, has provided valuable indications of the line of development to be pursued in the future.

As regards performance, the Mark II "Southampton," of 1928, has a maximum speed of 92 knots, a cruising speed of 65 knots, and a range of 505 miles, with 1,000 lbs. of bombs or possibly 700 miles without. This improvement in performance is very creditable if one considers the leeway that had to be made up in the other two directions which, until this balance was reached, had received most attention.

Apart from the fact that it is a twin-engined boat, the "Southampton" bears no resemblance to the "F.5" in either design or construction, and shows advantages over it down to the smallest detail, the greatest difference being perhaps in the construction and lay-out of the hull. This is now made entirely of metal and, though no larger, provides sufficient space and accommodation for the crew to live on board for days at a time, while allowing access from one end to the other, thus facilitating considerably the more efficient operation and defence of the boat. I venture to think however, that of all the improvements, the increase of "freedom of action" is the most vital and outstanding. It is an omnibus term which describes the advance made as a whole in consequence of the detailed improvements effected. An interesting point is that this all round increase was incorporated in a boat with a span of 25 feet less than the "F.5" and weighing, fully loaded, about a ton more.

Since the inception of the "Southampton" and the subsequent modifications made thereto, further types have been tried out for both military and civil purposes. In them size is once again becoming the dominating factor, but for other reasons than those which led up to the large types of the 1917/19 programmes.

SEAWORTHINESS.

Although the air is the chief element in which the flying boat operates and a good air performance is the main consideration, the importance

of seaworthiness cannot be over-rated. As, however, there is a great deal of misconception as to what is exactly meant when this term is applied to flying boats I will endeavour to make it clear. It does not truly represent the quality to the full extent which it is hoped to produce but is used in the absence of a better one and also from custom. It applies very well when the flying boat is taxiing or at anchor on the water, but does not quite fit as a description of the behaviour desired when the boat is rising from or alighting on the sea.

For convenience we will consider the subject under two headings:

- (a) When manœuvring on the sea or moored out in a harbour;
- (b) When rising from or alighting on the sea.

With regard to the first we can say a considerable advance has been achieved. It has been found possible to moor out flying boats in safety in any reasonably sheltered harbour and that, so secured, they ride at anchor far more comfortably than other surface craft of larger dimensions. The stage has been reached when it often proves to be unsafe to go alongside them on account of the probability of damage occurring owing to the size and unwieldiness of the vessel it would be necessary to send out to them. The wonderful improvement in this side of their seaworthiness has also considerably lessened the risk of damage when forced down on a rough sea.

To a considerable extent this quality is inherent in the flying boat owing to its buoyancy, the design of the hull and general distribution of weight. The effect is to give them remarkable freedom of action, enabling them to dispense with large and expensive sheds, where they would often be weather and tide bound. This, in turn, has removed the risk of damage in launching and rendered them immediately ready for operations, besides affording many other advantages.

The more difficult problem, that of being able to rise off and alight on the open sea in rough weather, has yet to be solved. To rise from or alight in a harbour sheltered from the high waves of the open sea has been possible for some time, even if it is blowing a full gale, but no attempt to do so has been made, to the best of my knowledge, from the open sea when the waves are over ten feet high. Experiments in this direction are continually in progress and are mainly centred in efforts to reduce the landing speed without seriously affecting other important aerodynamical qualities.

The landing and take-off speeds of any one type of aircraft are approximately the same. To effect a safe take-off in a rough sea it must be accomplished in the shortest possible time and at the slowest possible speed. The necessity for even the largest liners to slow down in rough weather in some measure illustrates this point. The problem

is entirely an aerodynamical one, and unfortunately of the vicious circle type, so we can only hope that some other factors from outside the circle such as the now famous "slots," or the autogyro will help to solve the difficulty.

Personally I think it is questionable whether we are not attaching too much importance to obtaining this last ounce of seaworthiness, whether it be for military or commercial uses. The chief function of the flying boat is to remain in the air and only to use the open sea as an aerodrome when the weather is sufficiently fine for refuelling, conserving fuel, awaiting rendezvous and the like. Further attempts to attain this last ounce may be at the expense of other and more important operational qualities, i.e., speed and endurance, neither of which fit in with that low landing speed which plays such a vital part in obtaining seaworthiness of this order.

It is fully realised how advantageous it would be, but for some time to come it will be necessary for the flying boat to remain within flying range of a base in rough weather. There is one helpful factor which is perhaps worth mentioning and that is the wind that makes the rough sea, since the nearer the speed of the wind is to the slowest flying speed, the slower the relative landing or take-off speed over the sea becomes; so if both are in the region of fifty miles per hour the boat would rise or descend like a helicopter.

Actually it is less risky to land in a rough sea than to take off in one, and as I have just indicated, the stronger the wind the better the chances. If a safe landing is made it is probable that the boat will survive if clear of danger such as a lee shore, rocks and sandbanks, until the wind drops sufficiently to take off again or shelter is reached.

The question of seaworthiness is a large subject in itself and I am afraid I have only been able to touch on the fringe of it.

MAINTENANCE AND HANDLING.

Now that flying boats can be safely moored out a number of the old difficulties of maintenance and handling have been removed, but several new problems have had to be faced, the more important being :

- (a) Protection from the corrosive effects of weather ;
- (b) Maintenance and the changing of engines and other parts on the water ;
- (c) Refuelling and the loading of bombs and other stores ;
- (d) The provision of a suitable anchor and cable, effective in use, yet light enough to be taken up in the boat in the air.

All these are in a very satisfactory state of development though, naturally, improvements are continually being asked for and supplied; but the problem of the anchor remains a most difficult one. Anchors of every known type have been tested with very interesting results, but this again is a separate subject.

It is rather an astounding fact that the work of maintaining the boats on the water is considerably less than in the days when they were housed in sheds. The crew alone can keep them in efficient condition for quite long periods.

The boats are equipped with their own refuelling apparatus and only require the petrol to be brought to them in some form of container; alternatively they can taxi up to a vessel or to the end of a pier and refuel. On the long cruises that have been carried out the petrol has usually been obtained from a barge or small oiler to which the flying boat has taxied and made fast astern.

Accommodation for the crews to live on board for several days at a stretch has also been provided and is utilised when on long flights and cruises.

Handling the boats on the water requires a good deal of experience, as they have peculiar habits of their own. They are very much affected by the wind, sea and tide. They are like a sailing boat with sails rigidly fixed, which cannot be furled, and also like a steamer whose engines will not go astern; also, as they are as long as they are broad, and at the same time very easily damaged by collision, you can imagine some exciting moments occur during a pilot's training. Picking up a buoy when it has to be done across wind and in a flowing tide requires fine judgment in allowing for speed, drift and the use of the controls.

Piloting in landing and taking-off also requires some special training in judging the height from the sea, the height of the waves and a wavy sense of feel in taking off, but piloting in the air is quite normal. Taking the air in a flying boat in the hands of a competent pilot is one of the most enjoyable and comfortable ways of flying, and the sensation of landing and taking off, even in a rough sea, is scarcely noticeable.

BASES AND SUPPLIES.

As flying boats increase in size and consequently in cost and time to build, the numbers available for service even in war time will necessarily be limited, while organized bases where overhauls and major repairs can be carried out will be essential. It will not be of vital importance that these bases should be situated near the theatre of operations, as temporary repairs can be effected at an advanced base and the aircraft then flown back to the repair base.

This is not quite so hypothetical as it sounds if casualties due to enemy action at a distance from friendly help or shelter are omitted. Serious damage received under those conditions would probably entail the complete loss of the boat. Fortunately flying boats lend themselves to temporary repairs more readily than other aircraft, both on account of the nature of their construction and the fact that damage due to forced landings, or other causes, is seldom so severe that a working party cannot patch it up sufficiently for a flight back to the repair base.

For operational work a temporary base is essential. This must be situated in a harbour sufficiently sheltered to permit of refuelling, ammunitioning, and reasonably quiet so as to afford rest for the crews. No special preparation for a temporary base apart from the supply of normal stores is required. The area of water, to be ideal, should be long enough to allow the boats to take off in any direction of wind, i.e., about a mile square. The bigger the harbour the better, within reason, as it is more likely to provide additional advantages such as small bays in which to site and camouflage the base, a sandy shore on which to beach the boats for inspection and repair, and freedom from obstructions, either on the water or due to the height of the surrounding country. The Solent is a very fair example of the ideal large base, and was utilised as far back as 1922 for experiments, to test the seaworthiness of five different types of boats. They were moored about two miles west of Calshot Spit and rode out a forty-five knot gale in company with their parent ship, H.M.S. "Ark Royal." In such a harbour a good lee is always to be found to which the flying boat can taxi for the purpose of taking off. Harwich is a good example of a small harbour, for although it is not a mile square, its shape allows for "take offs" in any direction, and the surrounding country is low, whilst there are several good beaches, and the estuaries of the rivers Stour and Orwell provide excellent sites for a temporary base. For civil work the selection of a harbour is even an easier matter though it depends of course on its value as a port of call.

In all the thousands of miles of coast line in the world there are but few stretches of more than a hundred miles or so where it would be impossible to find a shelter suitable for flying boats.

In very general terms, a suitable base for flying boats could be found to-day within striking distance of any legitimate objective, and such a base would not need previous preparation, although it might first have to be seized or subsequently protected. A temporary base is, of course, useless unless supplies can reach it, and until the aerial store carrier is forthcoming, bulk supplies of petrol and ammunition will have to be transported by other means and this will have to be considered in the choice of a locality.

The operation of flying boats away from a permanently equipped base having become practicable so very recently—indeed it is still in a state of trial—the equipment of a temporary base has not yet been standardised. Apart from the requirements of petrol, oil, ammunition and food, the remaining supplies would not weigh more than a few tons on a three months' basis.

TRAINING.

One flight of flying boats has been maintained at Calshot ever since the war. Cruises are carried out by this flight away from Calshot on reconnaissance and patrol exercises and to train the crews in the maintenance and operation of the boats at places where none of the usual facilities exist. In addition it has co-operated in annual fleet and submarine exercises.

There is another flight at Calshot which is used in connection with the practical side of the Coastal Reconnaissance Course through which flying boat pilots have to pass. This course includes air pilotage, navigation and reconnaissance duties in its many branches.

At Felixstowe there is a flight known as the Flying Boat Development Flight, which carries out the equivalent of service trials for each new type after they have completed the programme of experimental trials.

Owing to the expense and experimental nature of flying boats it is the policy not to put each new type, if successful, into service, but to use the data and money to achieve still further improvements. Every year since the 1922 cruise a flight of the latest experimental types has been manned by the personnel of the Flying Boat Development Flight and has been sent away on an extended cruise of about a month's duration. The three main objects have been :

- (a) To test their ability to operate away from a base ;
- (b) To obtain a comparative test of the improvements made in performance, controllability, seaworthiness, etc., over previous results ;
- (c) To test the equipment and apparatus provided for handling and maintaining them as a self-contained unit.

The longest of the cruises with *experimental* types was that made to the Baltic Ports in August, 1927. The only preliminaries arranged have been for the provision of fuel and moorings, though the latter have not always been necessary as the boats have used their own anchors in preference.

The most ambitious of these cruises, now drawing to a close, is that which is being carried out by the Far East Flight, equipped with four

boats of the "Southampton" type, which is the standard type in service to-day. The special object of this cruise is to gain information on the behaviour, operation and maintenance of flying boats working in tropical conditions. Ample time has therefore been allowed for every aspect of the task to be thoroughly investigated and so far it has been attended with absolute success.

The Flight left England in October, 1927, for Singapore *via* Malta, Alexandria, Basra, Karachi, Colombo and Calcutta. From thence they proceeded round Australia visiting the principal seaboard towns and then returned to Singapore. They have now set out for Hong Kong *via* the Phillipines and are to return by way of Siam. The visits to Karachi, Singapore and Sydney were prolonged to enable special study of the local conditions and to allow time for overhaul if such was necessary. When not flying, the boats have been kept on the water for over ten months and each boat has been maintained during this period by its crew of two officers and two or three airmen. After leaving Karachi, Sydney was the only place where organized facilities for repair existed and, except for routine exchanges of certain details and a general clean up, but little was required. On return to Singapore, the Flight will have been absent from England for fifteen months and will have flown approximately 25,000 miles, surely a most remarkable performance, particularly in view of a recent report from the Commanding Officer, in which he states that the boats show little signs of depreciation after this long period of service and exposure to all types of weather. This achievement illustrates better than anything I can say what a great advance has been made in flying boats in the last few years. It also illustrates the points I have already put before you with regard to the ease of finding suitable harbours or aerodromes, and that elaborate equipment and large quantities of stores are unnecessary for specified periods of service.

SERVICE FUNCTIONS.

During the Great War the flying boat was chiefly employed in anti-submarine operations on the coastal shipping routes, for convoy and escort duties and reconnaissance. The results achieved by aircraft, which took part in anti-submarine and convoy work cannot be measured by the number of submarines they actually sank, but rather by the effect they had in keeping them below the surface. It is generally accepted as a fact, I believe, that no ship was sunk whilst an aircraft was in company on patrol, although the enormous total of nearly five million miles were flown on these patrol and convoy duties. Two Zeppelins were also accounted for by flying boats operating from Yarmouth and Felixstowe respectively.

As regards heavier-than-air craft, flying boats claim one third of the total mileage flown between 1916 and the end of the war, while, of the submarines allowed by the Admiralty as destroyed, five were credited to their bombs besides a few others damaged. If one considers that the cost of only one of the destroyed submarines was roughly equal to the cost of all the flying boats used in hunting them, and one takes into account the almost primitive state of aircraft, bombs and bomb sights of those days, one is bound to admit their value for similar service if necessary.

Although submarines have improved, the offensive powers of flying boats have increased in even higher proportion. With the large increase in speed it is now possible to fly over the position in which a submarine has been observed, say about two miles away, in a little less than a minute, and the destructive power of the bombs or depth charges that can be dropped has been considerably increased. Great improvements have also been made in the navigation of the boats and in the accuracy of bombing.

It is now fairly evident that had the Allies possessed flying boats of the present day types the activity of enemy submarines and raiders during the Great War would have been very much curtailed. This is not a matter of mere speculation as it is known, from the Official History, on how many occasions enemy "raiders" escaped out from harbour, missing observation by passing only just out of sight of the watching cruisers and patrol vessels, and again eluding, by a matter of hours, those sent to destroy them. The increased mobility, radius of action and air endurance produced in flying boats since those days as compared with any possible increase in the speed and elusiveness which can be made in surface vessels is bound to bring forward many new problems in which the flying boat will figure in the attack and defence of seaborne trade, as indeed will also the aircraft carried in carriers, cruisers, armed merchant vessels and submarines.

EMPLOYMENT SINCE 1922.

Apart from the duties already alluded to in connection with peace training, and certain long distance civil flights, such as the circuit of Africa by Sir Alan Cobham, the employment of flying boats since 1922 on any particular duty has been almost negligible. By that it is not meant to infer that we have neglected to investigate during each stage of development the many and various functions it is deemed possible for them to perform. On the contrary this has received the closest attention as flying boats have been tested for service in a variety of duties from spotting for shore batteries to searching for shoals of herring for the fishing fleets. Mainly, however, the period has been spent in

constant research and experiment to further the production of the ideal flying boat, that is to say an aircraft able to carry out all normal duties, with some limitations, perhaps, as regards air fighting, but particularly suited for world-wide service without specially prepared bases.

It cannot, however, be too strongly emphasized that this development is still in the early stages and we have, in consequence, hitherto deliberately avoided designing a flying boat to perform any special function. A general and well balanced advance in performance, seaworthiness and mobility in one type is the definite object in view, as it is quite clear that if the great potentialities of the flying boat are to be realised to the full, these three qualities must be obtained in fairly equal proportions, since failure in any one destroys the virtues of the other two.

Progress is bound to be slow, as it cannot be confined to the skeleton of the flying boat, but sometimes has to await improvements in such component parts as engines, wing sections, forms of control, instruments, armament, new metals and a hundred and one other items. Obviously, too, with no previous war experience other than the anti-submarine and convoy duties, it is unwise to dogmatise about specific duties until the production of the ideal is nearer accomplishment.

It is, however, the great asset of mobility, due to the facility of utilising the water as an aerodrome, which renders these craft of special value in the air defence of the Empire and of our vast external interests. In my view, the value of the flying boat for military purposes will mature with the growth of an immense air transport system for which air ports and bases will be opened all over the world.

FUTURE MILITARY USES.

The functions of flying boats are often regarded as being restricted to operations with or against surface craft and submarines. This conception, however, is a very limited view of their usefulness as a unit of the Royal Air Force, even in their present degree of development, though it is probable that the majority of their duties will continue to be over the sea or within flying range of it.

Occasions may arise when, owing to the difficulty of establishing aerodromes for other types, flying boats will be the only aircraft which can be sent to arm or re-inforce a threatened part of the Empire, or make a demonstration of force during the preliminary or early stage of hostilities. Operations inland from a lake, river or coast base are equally possible, for although flying overland may not be considered as exactly the prerogative of the flying boat it is frequently carried out with multi-engined types without taking undue risks.

The duties a flying boat may be called upon to perform may be very varied and the relative importance of these duties will depend very largely on the nature of the enemy and the theatre of operations. In one case it may be required to work in co-operation with the Navy, in another with the Army or in yet another on purely Air Force reconnaissance, bombing or other operations. To go into the details and possibilities of the flying boat taking part in any one of these duties would form the subject matter of a separate lecture and would be out of place in this particular one. Still a few general remarks may be of interest.

CO-OPERATION WITH THE NAVY.

(i) *Anti-Submarine Duties.* Their usefulness in this work I have already described. With the air endurance we hope to attain it should be possible for a flying boat to maintain a patrol over an area of sea during daylight hours. This will be particularly valuable in narrow shipping channels or over focal or terminal areas.

(ii) *Convoy and Escort Duties.*—Again increased range and air endurance will add materially to their value for this work and will reduce considerably the number found to be necessary for this specific service during the war.

(iii) *Reconnaissance.*—The area of reconnaissance for fleet purposes, though it has already been considerably extended owing to the increase in range, is still limited to that which will allow the boat to return to its base. A sweep of 500 miles ahead of a fleet leaving harbour will be possible in the future. Alternatively flying boats could remain with the fleet for six to eight hours after leaving harbour and until the carrier aircraft take over duty.

(iv) *Fleet Actions.*—If a fleet action is fought within 500 miles of a base—and history indicates the probability of it being at no greater distance—the flying boats might be called upon for reconnaissance and bombing.

FLYING BOATS AND AIRCRAFT CARRIERS.

Except under the most favourable conditions flying boats will not be able to remain at sea with a fleet or proceed out of range of their base or advance base until their fuel capacity and seaworthiness have been very considerably increased. In regard to the latter, this must be improved to an extent which will enable them to rise from the sea in rough weather, a condition which, as far as can be foreseen, is too far from realisation to warrant consideration.

In this connection I have often heard it asked whether the flying boat will be able to replace the carrier and the answer is, definitely, no,

for the above reasons, and because the fleet must have aircraft always ready for operating.

FUTURE DEVELOPMENT.

In the near future we shall possess flying boats with a maximum range of 1,500 sea miles; a maximum speed of 115 knots; and capable of carrying a load of bombs or torpedoes of 2,000 lbs., a distance of 870 sea miles.

The operational value of these boats will be enhanced in many other ways as a result of the experience gained on the more recent long cruises and particularly that of the Far East Flight. The extreme range they possess will be used to fly them to the theatre of operations in which they are to take part and for long distance reconnaissance. The top speed is of value to enable them to reach the objective in the shortest possible time. The maximum endurance will be used for sustained patrols over a particular area.

The distance from the base to the objective when the full load of bombs is carried is at present limited to approximately five hundred miles.

Having attained a reasonable range, speed and endurance for coastal patrol and reconnaissance work, let us consider what are the other principal qualities a flying boat should possess in that wider field of operations I have described.

Firstly, they must be able to fly to the selected base under their own power and not be dependent on the friendly attitude of other nations. Therefore a long range is necessary, and 1,500 miles is being aimed at. This will allow them to fly to the Far East and Australia by quick stages and utilizing only British territory *en route* for refuelling. America is out of range for practical purposes at present.

Speed is the next most important consideration, as it minimises the effects of strong head winds when flying to a destination, and it is also necessary for operational reasons. But here there is a wide field for argument. There is not, however, time to go into this now, except to say that for anti-submarine and reconnaissance duties a high speed is required, while for maintaining a watching patrol or for escort duties a slow speed is better; the latter is also an aid towards obtaining seaworthiness. A big range in speed between, say, 50 and 100 knots would solve the difficulty, but to provide it in one type seriously affects other desirable features.

Another aim is to improve still further the flying boat's offensive and defensive powers by increasing the military load and lessening the risks of vital damage being received from enemy gun fire.

Beyond these are the considerations for improving those features which tend to increase mobility and the operation of the flying boat as a self contained unit.

The whole of my remarks have been applied to British built boats and I am glad to say we are well abreast of foreign types. In one respect or another some of the foreign types are superior. It may be in speed, endurance or useful load, but we have developed a compromise which falls but slightly short of their best in any one direction and excels in all others.

DISCUSSION.

THE FLYING BOAT FOR IMPERIAL AIR ROUTES.

AIR VICE-MARSHAL SIR VYELL VYVYAN: I heartily endorse the lecturer's statement that very shortly the flying boat will be much more used. Imperial Airways has been, perhaps, a little slow in taking up the use of flying boats, but the reason is that up to the present time they have not been sufficiently developed. Recently, however, the development has been so rapid that we propose to use them. Next April, as you know, we are starting a service to India and some sections of the route will be traversed entirely by flying boats. In course of time we shall go much further than that: I hope to Australia; and the majority of the journey will be done by means of flying boats. But it is only recently that the flying boat has come into its own as a commercial proposition.

I should like to mention one thing which, from the point of view of civil aviation, has been found to be absolutely necessary, and the Air Ministry is taking up the subject too. Experience has shown that flying boats require very much bigger anchors than anybody ever thought they would. During a recent gale at Southampton we had a flying boat moored out, and we had to employ very heavy anchors indeed. With these, it came through the gale quite safely while the hangar was demolished.

THE CHAIRMAN.

Our lecturer has given us an extremely good sketch of how the flying boat came into being and its potentialities in the future. In thinking of the problem of the application of flying boats to war, the first question which arises is what is the flying boat? She is a small vehicle, small in comparison with vehicles like the "Leviathan" and ships of that kind; she can carry a small load of some kind, human beings, or it may be weapons, at a very considerable speed for what is at present not a very great distance, but which at any rate is a respectable one; and she can remain in the air for about six to eight hours. Her employment may be either civil or military. Of her civil employment it is not for me to say anything, but one can see very great possibilities in her as a rapid means of carrying passengers and valuable cargoes.

So far as military uses are concerned, one can look at the flying boat in two lights, either as a transport to carry small bodies of men where they are wanted very rapidly, or as a vehicle like a ship, or an armoured car to carry weapons. Of course, it may be a considerable time before she is able to carry men in very large numbers, but it is quite easy to see that where rivers run through a country, like Iraq or Egypt, the flying boat affords the great convenience of being able to send rapidly to any point where trouble may arise small bodies of troops, starting from, and arriving at, a landing place on water which needs no previous

preparation. She can, alternatively, be an actual fighter herself, going with her own guns to carry out such an operation. In either of these capacities she is obviously a valuable vehicle.

NAVAL USES.

When we come to think of her as a naval weapon carrier she can be used either as a gun-boat or as a torpedo boat. I do not attempt to forecast anything further than I can see at the moment, but as a gunboat she can hardly be expected to carry weapons of such a size as to make her very valuable in that respect; but as a torpedo boat—using the word "torpedo" to cover those implements which go under water and produce under-water explosions, whether in the form of bombs or torpedoes—she has a considerable use, though some caution is needed in anticipating her use in fleet actions, for fleet actions do not necessarily take place near one's coasts, nor is it so easy as some suppose for boats to join and take part in the action. The battle of the Nile and many others were fought a very long way from British bases.

The lecturer referred in particular to her use as a protector of commerce against submarines. There, I think, it is hardly possible to deny that she should be of very great use, provided she forms part of the command engaged upon the operations in defence of trade; but that is essential. Nobody who has seen any operations of that kind can express a contrary opinion. We undoubtedly want, as Wing-Commander Maycock very justly said, to keep her speed down and to make it more flexible, so that she can keep more in contact with the convoy she is protecting.

I do not attach much importance to the question of patrolling which the lecturer mentioned. Patrolling against submarines during the war did not prove really effective. We continued to do it for a very long time, but when we consider the question of using flotilla craft, whether those in the air or those in the water, we should have done better if we had got away from the system of patrol at an earlier stage and adopted the system of convoy. In the convoy system, in so far as defence against submarines is concerned, naval flying craft will come in, and provided they can keep the air and keep with their convoys, will be as useful in the future as they have been in the past; indeed, more so, since we shall know more about the business. But I do not foresee great utility for them, at least until they have more accurate weapons than those they possess—the torpedo and bomb—in defending convoys against attack by surface craft.

On one subject I differ from the lecturer when he said that flying boats would be of use to prevent raiders escaping. I am convinced that such is not the case. The experience of the escape of raiding vessels in the late war gives no reason whatever to suppose that flying craft would have stopped them. Consider for a moment from whence the raiders escaped, and the conditions under which they escaped. The "Moewe" slipped out on a winter's night, on 22nd December, went up the coast of Norway, and fetched a compass round or near Iceland. I think the official history says she probably went round Iceland. That is, 600 miles to the North of Scotland. We could not expect even the improved flying boats of to-morrow to maintain a patrol up in those regions, particularly in the winter months when there is, practically speaking, no daylight, and to intercept raiders there. Nor, when raiders operate on the open sea, like the "Emden," the "Karlsruhe" and the "Wolf," could you expect flying boats to intercept them. Hunting for raiders on the open water is, as Mahan said many years ago with reference to the same subject, when considering the use of ships, very much like looking for a needle in a bundle of hay. Further, the area on which they observe,

large as it seems, is not very great in comparison with the whole expanse of ocean in which the raiders cruise.

COASTAL RECONNAISSANCE.

Wing-Commander Maycock referred also to the question of coastal reconnaissance. I am bound to say that I attach but little importance to coastal reconnaissance—indeed, I often wonder exactly what is meant when people talk so airily about “coastal reconnaissance.” What is reconnaissance intended to do? Its only use is to furnish information—to find out something, and I do not quite know what it is you are going to find out that is going to be of very much use in many cases. It depends where you are. If you are considering the coasts of a country somewhere near another country from which an invasion may be expected and of which you want to get warning, there is a use. If, on the other hand, you are considering the coasts of a country which is a very long way from anywhere, the invasion of which is outside the range of practical probability, then a coastal reconnaissance is not of particular use: it is merely guarding against an improbable attack. Indeed, to do it effectively the number of craft you would have to use is so large as to put the thing outside the range of practical politics. I have noticed much loose talk on this matter, which means waste of money.

STRATEGICAL CONSIDERATIONS.

One thing, I think, is important, and here I am perfectly sure the lecturer will be the first to agree with me, and that is that in the development of the flying boat, strategy should go hand in hand with that development. The thing must be watched and followed absolutely continuously in consideration of the problems of strategy. I say this with some emphasis because there is always a possibility—it is not confined to flying boats but applies to every class of vessel—that the ideas of the enthusiast may run away with him. He may develop an admirable instrument so far as flying or swimming is concerned, but it may not fit in with practical strategical facts, and it may not be so necessary as he thinks for strategical reasons. I have seen in my time, and I expect many of you have seen too, a great deal of public money wasted owing to insufficient weight being given to strategical considerations. We hear, for instance, about coastal defence. One cannot help casting one's mind back to the French school of a few years ago, to Admiral Aube with his “*défense mobile*,” upon which the French succeeded in wasting a great deal of money for a great many years; the idea being eventually rejected as fundamentally unsound. I cannot help seeing signs of a recrudescence of that idea, but I hope we shall avoid any mistake of that kind and not spend the taxpayers' money except for purposes which are strategically sound.

APPEAL TO YOUNGER OFFICERS.

In conclusion, I should like to say that I have listened to the lecturer's admirably expressed statement with extreme interest. One thought that occurred to me as he was coming to the end of his lecture was this—how much I wished that more junior officers would come forward at this Institution, and give us the benefit of their views, because it is from the younger officers that we are going to make progress. The views of those of us who are going on the shelf, or are somewhere near it, require to be reinforced by those of the younger men. I assure you that we do want to hear the younger officers taking a greater part in the lectures and discussions here, and the more encouragement that is given to them to come forward and read papers of this kind, as little fettered as possible, the better it will be, not only for the Institution but for all three of our Services, and for what is more important than either, the State.

The usual votes of thanks to the Lecturer and Chairman were carried by acclamation.

AIR PHOTO-SURVEYING

By COLONEL H. ST. J. L. WINTERBOTHAM, C.M.G., D.S.O.

IT is unfortunate that there are so many meanings to the word Survey. An old song talks of surveying the world around, and it is in this sense that we must consider the survey of an air route or the aerial survey of Africa conducted recently in a few weeks by a famous pilot. There is a surveyor of taxes, also that useful member of suburban society the auctioneer and surveyor. For the soldier and sailor the word implies measurement on the ground above and below mean sea level, and, generally, the production of some form of map or chart from those measurements. Even in this narrower sense, however, a survey may be of many kinds. There is, on one side, the large scale such as the ordnance survey provides in that unique national possession the 25-inch series or such as the railway engineer makes at, say, 200 feet to the inch; on the other those geographical surveys compiled from travellers' sketches and measured latitudes which can be well enough shown at one in a million. These different classes of survey have resulted in as many varieties of technique. Angles may be measured with theodolite or compass, and distances with invar tapes, or by time on horse or camel. Air photo surveying is already developing a corresponding number of variations, each one suited to its particular purpose, and it is advisable to sift out those which are irrelevant to the purpose of this article.

It is possible, in theory, to map and to contour, from air photographs at any scale, providing that each part of the area in question is photographed from two different points in the air, and that there are in that area some points on the ground whose positions and heights have already been surveyed. The theory is unpleasantly complicated, but is, none the less, sound. It is practice which qualifies theory and demands that the methods employed shall lead to cheaper, faster, or more accurate work than ground surveying can offer. For contoured large scale plans

from air photographs the correct answer at the present time is the stereoscopic machine, weighing 5 tons or so, of which several examples are already on the market. These machines are, however, the pioneers. None of them seem perfect. To work them skilled mechanics are necessary and much survey is required on the ground before they can be called in. For certain purposes we do need a good machine. It would save much labour in quite unsurveyed areas, and a model which is already on trial in this country may go much further in the elimination of ground work and in speed of plotting than any of those now available. A 25-inch plan is not required, however, on service, neither would we, willingly, have carted five extra tons from Mons to the Marne and back again.

At the other end of the survey ladder a small scale map may be made on simple lines from an "oblique." Fig. 1 illustrates in simple form a good many difficulties in air photo surveying. So long as ground is sensibly flat it may be considered to be represented by the plan of the chess board in that figure. On an "oblique" a large area may be photographed and that area will follow the usual two dimensional perspective laws. The correct plan can be recovered by photographing, projecting or eye-copying, back into the true squares. To make the perspective squares on the oblique photograph it is necessary to see the horizon and to know the height of the plane and the tilt of the photograph.

In this same figure, however, a pawn is shown standing on the chess board. Now, however one plays with perspective it is impossible to recover the proper plan of that pawn unless its height and position are already known. Suppose the pawn to be a hill of irregular shape, it will be seen that no contouring can be done from the evidence of a single photograph unless the true plan is already known. Three dimensions are jammed into the one two-dimensional view.

Excellent uncountoured quarter-inch maps are being made of the northern lakes of Canada from these oblique views, but again, this is not the soldier's problem, nor the map on which to fight.

Having eliminated the extremes let us define what is required. Firstly the map must be sensibly accurate at a scale of 2 to 4 inches to the mile (the ordinary large scale map of military thought). The map must show tactical features clearly and accurately enough to provide a good measure of the angle of sight. It must be made very quickly and with instruments which are sufficiently light and portable to accompany a Corps Headquarters. That much is now possible, providing

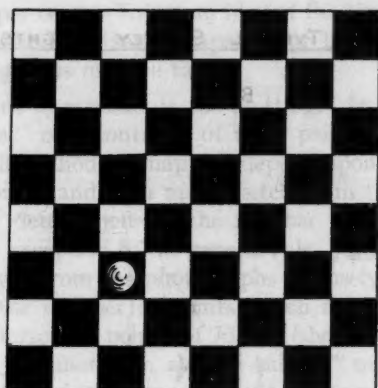
the weather be kind and the pilot expert. Weather is a tedious subject, and I have no desire to emulate the barber, but none the less come in it must. In Egypt or South Africa, and under all such sunny, clear skies photography may proceed from day to day for months perhaps on end. In England we may get two ideal days a month or one possible per week. During last summer we had a number of good days, although from heat, haze or thin fog they did not all prove available for photography. In the winter we may be without possible days for months on end. As one goes South and East to dryer climates so the photographic weather improves. It is no good looking for air survey unless the weather permits.

The pilot has many things to think of and many gadgets to control. He can, with training and knowledge of our needs, obtain the photographs which are required, but, naturally, war conditions will introduce many additional difficulties, not the least being action by enemy aircraft and anti-aircraft guns. The methods now in use for the style of map required are based upon vertical photographs taken without tilt along a straight course. Minor tilts or deviations from course can be corrected, but correction takes time, and it is just this that cannot be spared.

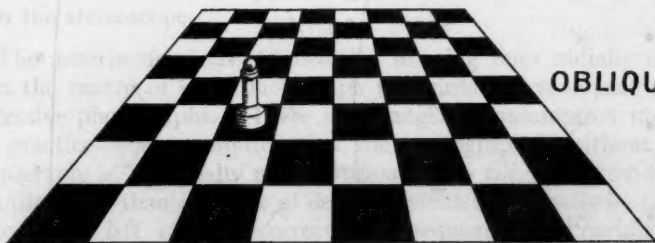
To illustrate the gist of the preceding paragraph I have shown on Fig. 2 the flight characteristic of three different strips. The small intersections illustrated on either side of the central lines may be neglected for the moment. The centre lines show the trace, or plan, of flight in each case, the numbered points being the consecutive positions of the plane at the moment of photography. A is the picture of a very careful, well-managed flight. B gives evidence of a considerable deviation from the straight line corrected in a wide curve by the pilot. It also shows up very clearly the fore and aft tilt (that is in the direction of flight) between points 1 and 2. The distance on paper between 1 and 2 will be seen to be much smaller than other intervals. C shows sharp deviations from line, accompanied by pronounced fore and aft tilt between 1 and 2, and to a lesser degree between 4 and 5. The internal evidence of the photographs also shows considerable sideways tilt during the exposures at points 3, 4 and 9. That evidence is, as a matter of fact, reflected in the small intersections which lie to the left of these points. As an estimate of the time taken in plotting from these various strips we may say that for every hour's plotting on the first run, there are two hours on the second, and three hours on the third.

The process adopted also calls for an overlap of at least 50 per cent. Each successive photograph, that is, includes half the area of its pre-

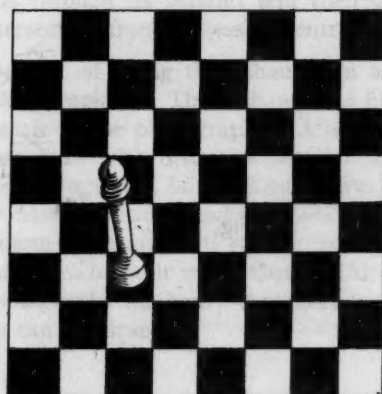
THE RESULT OF TRYING TO CORRECT TILT BY
REPHOTOGRAPHING ONTO A HORIZONTAL PLANE



TRUE
PLAN



OBLIQUE



RECTIFIED
OBLIQUE
ie.oblique
rephotographed
onto horizontal
plane.

Fig. 1.

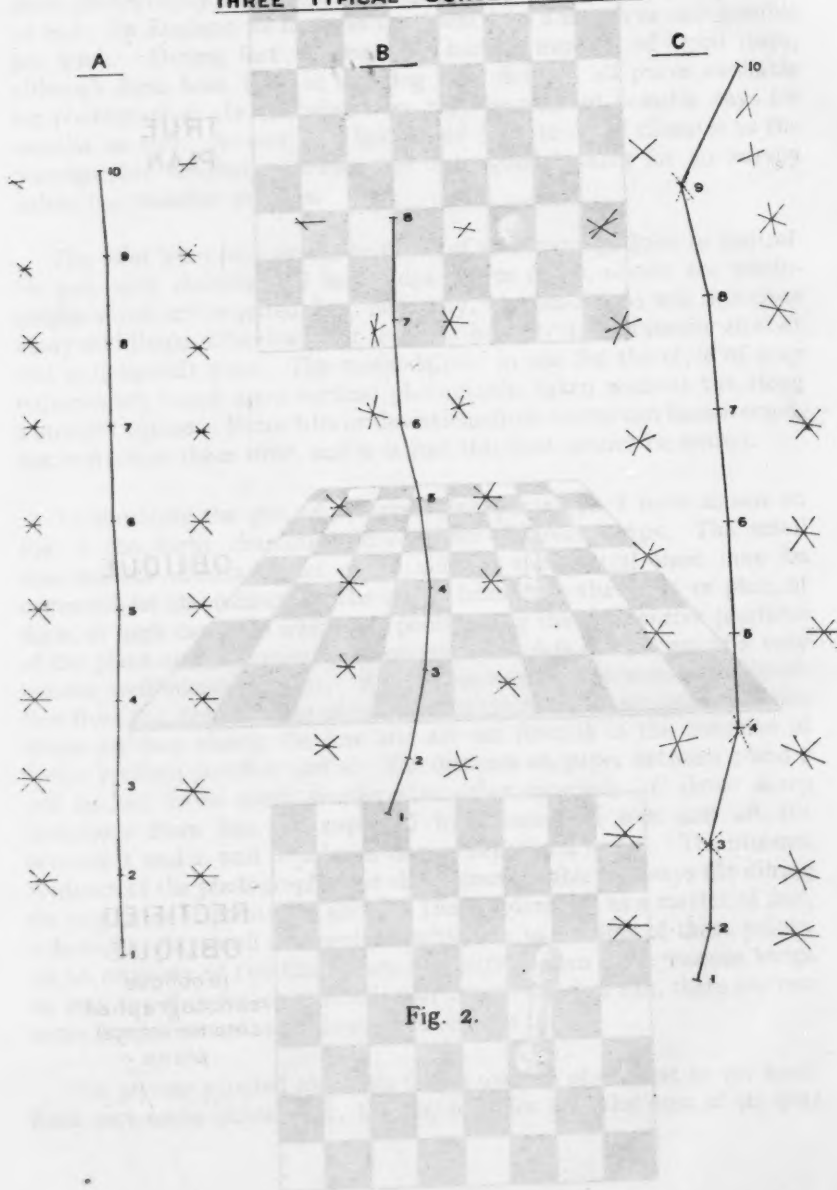
THREE TYPICAL SURVEY FLIGHTS.

Fig. 2.

decessor. To ensure this overlap 60 per cent. is asked for, and on service it would be wise to work, as with automatic exposure would be easy to do, to about 80 per cent. To get an idea of the time required in making a map one must start by setting apart four hours of *good* daylight in which the photographs may be taken.

The next point to consider is the plotting. It is customary to refer to the "skeleton" or "control" of fixed points upon which the final map is built. All methods of mapping depend upon a preliminary survey of "control" points, and then upon sketching in the intervening detail. The accuracy is determined by the number of surveyed points. Air photo work is no exception to the general rule, but many of these control points are surveyed from the photographs themselves. The main object is to cut down the number of points which must be surveyed on the ground. The intersected points of Fig. 2 (shown on each side of each flight) represent the photo (or, as it is called, "minor") control. The process consists of placing successive photographs under a strip of tracing paper, or celluloid. The distance between the first and second centre points can be identified on photograph A, and the orientation of a whole strip is carried out in this way, between successive centre points, but with much help, difficult to explain but easy enough to carry out, from the stereoscope.

The intersections are formed by drawing lines radially outwards from the centre of each photograph to points which appear on three successive photographs. There is a dangerous assumption underlying this practice—the assumption that the photograph is without tilt. A photograph is practically never without some tilt, but providing that that tilt is less than a couple of degrees, which it generally is, the small inaccuracies left can be corrected subsequently. Providing there is no perceptible tilt the foreshortened image of that pawn in Fig. 1 will fall directly away from the centre of the photograph. A line drawn radially outwards through its summit will then be a true direction in plan, and an intersection from successive centres will fix the position.

It is characteristic of flying that changes in air density constantly raise or lower the aeroplane. These changes in height are represented by a change of scale in the photographs. After the first pair of photographs have been dealt with distances between centres are not taken directly from the photographs, but each successive centre is "resected" from the already intersected and fixed positions of points on the common edge. In this manner a number of reliable positions are acquired and the rest of the map can be built up on them. During this stage of plotting (say 20 photographs an hour) the positions of targets or other important points can be surveyed.

So far no contouring has been done, and here the topographical stereoscope must come in. Fig. 3 shows a picture of one. This very handy and portable instrument shuts up into a small canvas case and weighs only $7\frac{1}{2}$ lbs. It is the key not only to survey from air photographs but to the easiest and best form of reconnaissance possible, short of seeing the ground personally. An overlapping pair of photographs, put in it, shows the relief as does a plaster model. Contouring then becomes a matter of knowing a certain number of heights, of spacing out the distance between contours along stream and up spur, and of following them out consecutively. The stereoscope itself has an ingen-

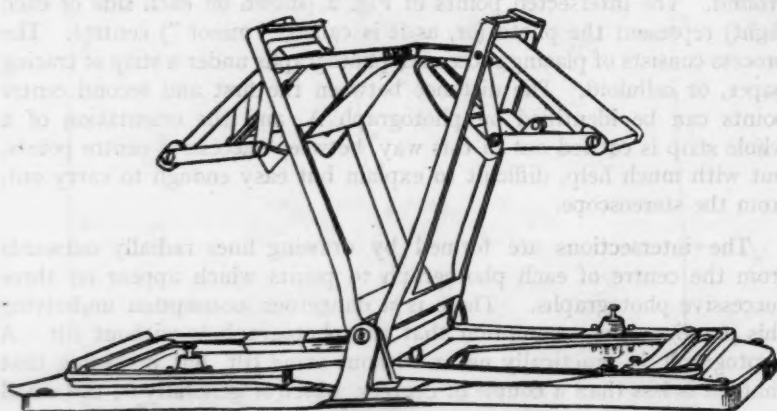


Fig. 3

ious device—a couple of glass plates with etched patterns upon them—by which additional heights can be measured. The practical effect of these movable plates, is to show a transparent, but quite visible, plane, which can be raised or lowered on the landscape, as if, indeed, water was gradually added or drained away, showing successive levels in the process. Providing the photographs are good and the surveyor well trained (two further important qualifications) the contours are really good.¹ I have no doubt that the maps now in hand by this process are better contoured than the average 3-inch European map. The final process is to trace

¹ A contour photograph is shown opposite page 94.

both detail and contours into their correct positions on the tracing paper, or celluloid of the minor control (Fig. 2).

Now all this surveying and plotting takes a time which varies according to the standard of piloting, the clearness of the photography, and the skill of the surveying. A speed of about two square miles per man per hour of fully surveyed and contoured work has been reached. Unfortunately this is not one of the processes in which a doubled staff gives doubled output. A corps front could be surveyed, however, to a depth of a couple of miles or so in four hours, and every day the methods and processes improve. Allowing for the four hours of photography a space of eight hours has now elapsed.

A question which will occur to many is how much survey on the ground is necessary. A certain number of *positions* and many more *heights* are required. For positions, one every 6 or 7 miles will suffice, but these are generally known sufficiently well in advance in previously surveyed country. Heights of sufficient accuracy are often available from levelling records and from the spot heights shown on hills and in valleys even on maps at quite a small scale.

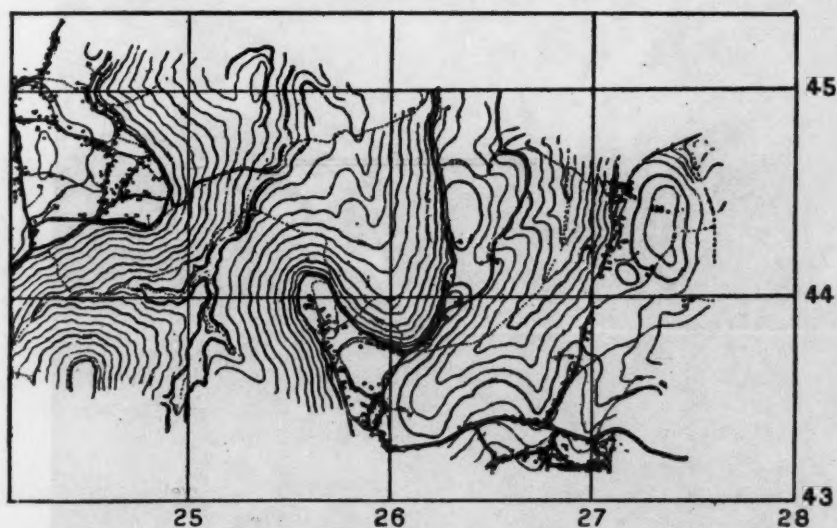
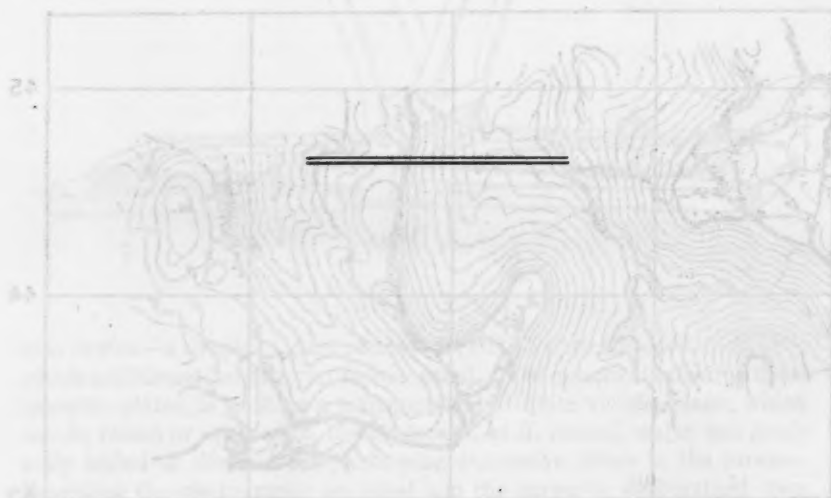


Fig. 4.

Fig. 4 shows a complete "rough drawing" of a portion of the Island of Gozo, in the stage immediately preceding the fair drawing. For

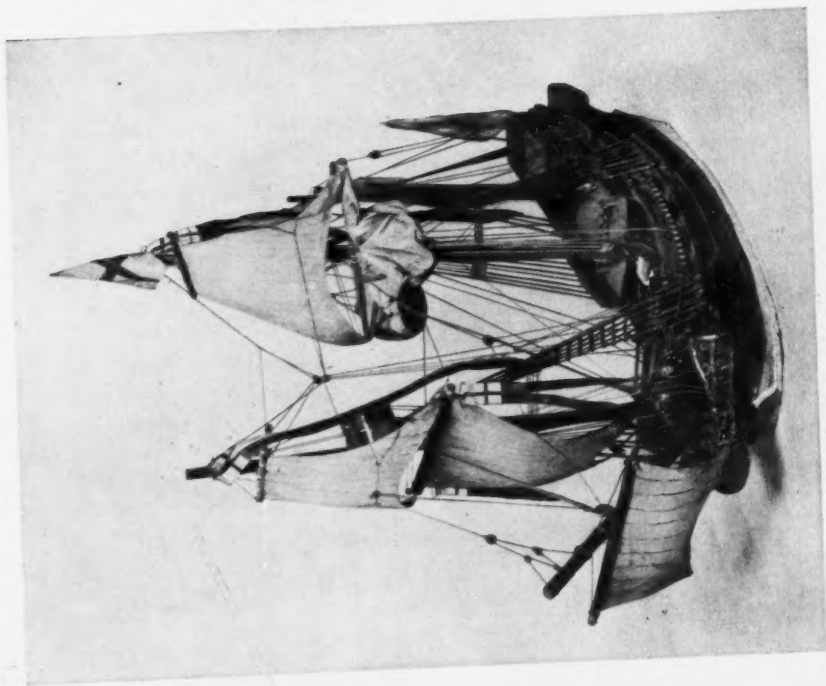
service purposes the map would appear in one colour, in the form of this figure, but with the appropriate names.

There is nothing either difficult in theory, or involved in instrumental outfit, in the methods I have attempted to describe. To achieve simplicity, however, we have been thrown back on real craftsmanship, in the aeroplane, in the dark room, and in the drawing office. Fast and good results may be, and are being, obtained, but nothing of value will follow on poor flying, and unpractised surveying.

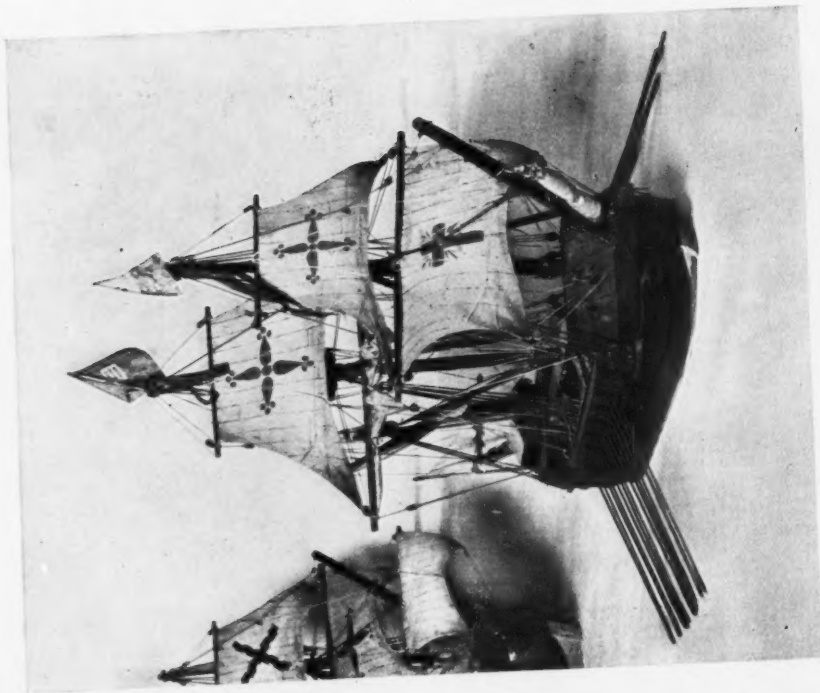




AN AIR SURVEY PHOTOGRAPH
CONTOURED IN THE TOPOGRAPHICAL STEREOSCOPE
(Reduced to about $\frac{1}{4}$ size)



DRAKE'S "REVENGE"



THE GALLEASS "SAN LORENZO"

ARMADA SHIP MODELS

(Types of the Special Exhibition in the R. U. S. Museum)

THE WORK OF THE BRITISH NAVY IN THE FAR EAST

By CAPTAIN L. D. I. MACKINNON, R.N.

On Wednesday, December 5th, at 3 p.m.

VICE-ADMIRAL W. H. D. BOYLE, C.B., in the Chair.

THE CHAIRMAN, in introducing the Lecturer, said that they had served together in China during the past year, and that he could testify to the very great interest that Captain MacKinnon had taken in all that was going on in the Far East at that time.

LECTURE.

THE "Far East" is a term that might be taken to cover a large portion of the globe, but I will confine this lecture to Chinese waters only.

Our position in China has always been a somewhat delicate one, chiefly due to the peculiar character of the Chinaman himself, but also due to the jealousy, or rivalry, of other European and Asiatic nations who are anxious to share in the commercial advantages of China. In consequence, although we have been at peace, officially, since the Boxer War of 1900-1901, the British Navy in Chinese waters is always in effect on a war footing, and from time to time occasions occur when force has to be used to protect our nationals and the commerce in which they are engaged.

To begin with, it is important to bear in mind the vast size of China and the comparatively isolated interests and communities which have to be protected. In addition, the work of the Navy is made more arduous on account of the navigational difficulties arising from strong and uncertain currents, long periods of fogs, and the fairly frequent typhoons—in fact, the China Seas are far from hospitable to the mariner.

The awakening of China came 350 years ago, when the Portuguese, having rounded the Cape of Good Hope, explored to the East, and finally reached Macao. The Dutch and English followed them in 1637, and once more the Chinese were in contact with the Western races, this time by sea route instead of land route. These pioneers of the West

were stimulated to these arduous and dangerous voyages chiefly by the big demand in the Home Markets for the new-found products of the East ; and China was rich in these.

The first trading port was Canton, and attempts were made to open up the markets of China for the benefit of the trader as well as for Western civilization.

The Chinese, however, did not welcome this intrusion. The resulting quarrels, struggles and wars cannot be recounted here, interesting though they may be, but they must be studied by anyone who wishes to understand thoroughly our position in China to-day.

Our trade with China gradually became a monopoly of the East India Company until the monopoly lapsed early in the nineteenth century, and Government protection was then afforded to all traders.

THE POSITION TO-DAY.

As a result of these struggles we find ourselves to-day situated roughly as follows :

Hong Kong is a British colony in every respect, and it may be regarded as a monument to British rule and energy. When ceded in 1842 it was a barren rock covered with a prickly scrub, and so infested with fever that even the Chinese pirates who patronised it could hardly live there.

To-day we find it a healthy place generally, opened up throughout with magnificent motor roads. The town itself consists of large and commodious buildings with all modern conveniences and luxuries. Miles of wharfage is available for merchant shipping with docks and building slips where large steamships are built. On the mainland is a strip of territory which is leased from the Chinese and this is also developed, or being developed, on the most modern lines.

There is a naval dockyard, which is well placed strategically for defence, but it can only form a base for a small fleet owing to the limitations enforced by the Washington Agreement.

Shanghai is an International Treaty Port. Originally, when ceded in 1848, it was nothing but a mud swamp. In an extraordinarily short time it has been built up into a large, flourishing and affluent town by Western science, capital and stamina. It is in no sense a naval base, but small repairs can be carried out by mercantile firms, and there is a plentiful supply of fuel and commodities.

Wei-Hai-Wei is now only a health resort for the China Squadron. It is due to be handed back to the Chinese as soon as there is a recognized Government. This small island has also been developed and converted

from a barren rock into a clean and charming country-side, covered with avenues of trees.

TREATY PORTS.

The chief Treaty Ports are : Canton, Swatow, Foochow, Amoy, Tsing-Tau, Chefoo ; Taku on the coast ; and the various river ports such as Chin-Kiang, Nanking, Hankow, etc. Altogether there are now some fifty Treaty Ports where permission to trade has been unwillingly given by successive Chinese Governments.

The history of the existence of the Treaty Ports cannot be explained now, but it may be briefly stated that their object is to form stations where the produce of the interior can be collected and sent off to Western lands in exchange for the manufactured articles from our more mechanically developed civilization. One of the principal duties of the Navy in the East is to protect this trade.

CHINA : A NAVAL PROBLEM.

There is a great lack of roads and railways in China, but fortunately there are exceptional natural facilities for water transport to convey merchandise from the interior to the coast ports. The chief water-way is, of course, the Yang-tse River and its tributaries. It is fortunate that this river flows so fast, because the only time a Chinaman ever gets on a hustle is when he drifts down a Yang-tse Gorge at 12 knots! The West River is next in importance, and then the Pei-Ho. The Yellow River is too shallow to be of the same value as a means of regular transport.

As water transport provides almost the sole means of communication with inland trading stations, their protection is a purely naval charge, and one which is additional to the normal work of protecting trade on the sea-ways. In order to carry out this duty a special type of ship—which I will shortly mention—is required to navigate the Yang-tse and West Rivers.

The command of the British Naval C.-in-C., China, is very extensive. It is exercised broadly as follows : there is the sea-going fleet under his personal control ; and there is a Rear-Admiral in command of the Yang-tse gunboats, responsible to the C.-in-C. for the whole of the Yang-tse River above Woosung.

At Hong Kong there is a Commodore in command of the Dockyard and other naval establishments ; he is also responsible for the work of the gunboats up the West River.

At Singapore there is a Captain-in-charge, with a small staff. This is the nucleus of the naval staff which will be required when the Singapore Base nears completion.

THE CHINA SQUADRON.

The China Squadron consists of the sea-going fleet and the river gunboats.

The Sea-going Fleet.—This is, at present, composed of:

Cruisers—	Aircraft Carrier "Hermes."
"Kent" (Flag of C.-in-C.)	4 Sloops.
"Berwick"	12 Destroyers and Flotilla
"Cumberland"	Leaders.
"Cornwall"	6 Submarines.
"Suffolk"	Various Auxiliaries.
"Castor" (attached).	

The new 10,000 ton "County" Class Cruisers, in addition to their normal fleet work, are invaluable for the protection of Shanghai, although not too easy to manoeuvre in the restricted and crowded river. At certain seasons they can also get up to Hankow.

The destroyers and sloops work in the lower part of the Yang-tse and also at the numerous seaports, especially those like Swatow, Foochow, Amoy, Taku, where a bar prevents the entry of larger ships.

River Gunboats.—There are about eighteen of these craft. They are of peculiar construction to compete with the navigational difficulties with which they have to contend. In the first place, they must have high speed to steam against the very swift currents experienced in the Yang-tse gorges, and the necessary speed of 15 knots requires comparatively large and powerful engines and boilers. They must carry a fairly formidable armament—preferably a 6-inch gun, weighing some 10 tons—and several smaller guns. The living quarters for officers and men must be arranged to be habitable in the extreme heat of the summer months, as well as in the very cold weather of the winter. Above all, the draught of the ships must be very small, on account of the shallowness of the river in the upper reaches—in some cases only four feet. That all these requirements have been met so well reflects great credit on the naval constructor.

The gunboats, under the Rear-Admiral on the Yang-tse, are commanded by Commanders and Lieutenant-Commanders, and they patrol the upper reaches of the river above Hankow, where it is quite extraordinary to find what a high moral effect they exercise on the Chinese. Their duty is to visit and protect the various trading stations on the river, where English nationals reside or where Missionary Colonies exist, and in the course of these duties they are frequently called upon to deal with delicate situations which require a nice balance between *fortiter in re* and *suaviter in modo* to avoid the creation of undesirable

incidents, not only with the Chinese but also with the other nationalities who have interests up the river with small means of enforcing them.

The West River gunboats have to compete with even shallower water, and consequently must be smaller in size. They frequently have to chase pirates down the tortuous creeks in the estuary of the river, and in consequence, their armament must be more restricted. On the other hand, they do not have to compete with such fast currents as obtain in the Yang-tse, neither do they operate at such a great distance from their base.

The best known gunboat on this river, H.M.S. "Robin," has just finished her active career of some twenty-four years. She has been known to the local Chinese for so long that even the pirates must miss the ship that has harried them so continuously.

THE "FOREIGN DEVIL."

Our situation in China may be summarized as follows:—

The sole reason for our presence is commercial. We never have had ideas of conquest. China is rich in various commodities which are in great demand in the civilized countries of the world, and normally a flourishing trade would be possible by an exchange of her raw materials with the manufactured goods of the West, to the great mutual benefit of ourselves and the Chinese. But the Chinese never welcomed this trade, and only by means of coercion in the past have they been persuaded to allow their rich store of treasure to be used for the general benefit of humanity.

Gradually, however, by peaceful persuasion, we have penetrated far into the interior and started this beneficial trade, with the result that many millions of British capital are invested in the country, and many thousands of our people are resident there. Unfortunately, law and order as we understand them do not exist in China, and it is therefore essential that we should afford protection to our own vested interests, and, incidentally (at any rate in the past) to those of other civilized trading nationalities. Naturally, it is a decidedly delicate proceeding to afford this protection without unduly infringing on the rights of the Chinese in their own country.

We were the pioneers and, therefore, in the early days we bore the greater portion of this work of protection. In some ways our work was easier then, as we only had the Chinese to deal with. Now, with the growth of other nations' interests, the whole question has become greatly complicated on account of international jealousy. It is a hopeless task to try to persuade other nations that we are acting in their interests as well as our own when we take up some definite line of action.

It is a common saying that China has been in a state of chaos ever since we first set foot there, but this chaos has been unusually apparent since 1909, when Sun-Yat-Sen launched the great so-called "Nationalist" movement to regenerate the Chinese and bring them in line with modern civilized nations. I doubt if any prophet would be bold enough to forecast the result of this movement: whether it will eventually produce order out of chaos, or whether it will be swamped by the formidable inertness of the Chinaman; but, undoubtedly, it will be a Herculean task to instil new ideas into that ultra-conservative individual. The one thing certain is that the existing state of chaos necessitates a considerable increase in the police work of the British Navy, for if two or three factions of Chinese weary of disagreement among themselves, they can always patch up a temporary truce, and ease their safety valves, by a combined assault on that common enemy, the "foreign devil." This process requires a good deal of vociferous propaganda, because, generally speaking, we are on excellent terms with the Chinese, especially the more intelligent trading class, whose Mecca on making their fortunes is Shanghai, or preferably Hong Kong, where they are safe, and become to all intents and purposes British citizens.

The assault on the "foreign devil" may take the form of an actual attack on some isolated foreign community, or it may take the more insidious form of boycott, for which we probably have to thank the Communists more than anybody. The boycott is an unpleasant form of attack, for quite apart from financial losses, it inflicts great hardships on the foreign community, who, while living in considerable danger of their lives, have to carry out all the menial and unpleasant tasks ordinarily performed by coolies.

Under such conditions the presence of a man-of-war at once becomes essential, both to assist the inhabitants with their daily tasks, and also to protect their lives. The China Squadron, therefore, is seldom able to work together as a squadron, the ships usually being separated and distributed at various ports in localities where disturbances are likely to occur. In consequence, the actual work of the Navy of the past few years consists of a collection of incidents pertaining to one or two ships at a time, rather than any concerted action on the part of the whole fleet, as for example was the case in the Boxer rising of 1900. The work is, in fact, typical of the peace-time police work of the British Navy.

THE WANSHIEN INCIDENT.

One of these incidents was that usually known as the "Wanshien" episode. In order to appreciate what large issues frequently depend on these small incidents let me very briefly sum up the situation in China during the last few years.

When Sun-Yat-Sen launched his great Nationalist movement in 1909, he met at first with considerable success. In 1911 he overthrew the monarchy and established a republic with himself—very unwillingly—as the first President. Then a repercussion ensued and the usual quarrels started among the leaders of the various sects and parties of which China is composed. It became evident that a thorough revolution was required to establish the republic with a single government, and as this was beyond the organizing ability of the Chinese, Sun-Yat-Sen called to his aid those revolutionary experts, the Communists. Sun-Yat-Sen died in 1923.

By early 1925, the Soviet agents had got well on with their work under the leadership of General Gallen, a renegade Austrian, as Military Adviser, and Borodin as Political Organiser. A common enemy was required as a rallying cry to unite the separate factions of Chinese under their numerous War Lords, and so violent propaganda was started, in the first place against all "foreign devils," but gradually fining down to anti-British propaganda. We had the special honour of being selected as the arch-enemy, partly on account of our preponderating influence and interests in China, but also because it suited so well the amicable policy of the Soviet Republic, who, to a large extent were financing the revolutionary movement in China, as well as directing it.

The obvious aim of the Communists was to create such a difficult situation for us that we should eventually open fire on the Chinese seriously, and thus create an incident which could be grossly exaggerated and used as a lever to turn the Western nations against us. Our Government's policy in reply to this was one of patient conciliation, and we certainly went to extreme lengths in carrying out this policy. Seldom have we suffered such insults without retaliation. Undoubtedly the policy was a wise one, and the fruits of it are now beginning to mature, in spite of the loss of "face" which we suffered temporarily.

On 30th May, 1925, a riot was engineered in Shanghai, and to disperse the mob, the Police (Europeans, Japanese, Indians and Chinese, under British officers) opened fire and killed about twelve. This incident was used by Borodin to fan the flame of anti-foreign feeling which spread with rapidity. General strikes and boycotts were put in operation at all places where foreigners lived, and were especially directed against us. The one exception was Amoy where a Chinese Admiral stopped all the troubles.

The movement was especially fierce in the South, and even in Hong Kong itself a strike of Chinese was organized. In June, 1925, occurred the attack on the *Shameen* and a complete boycott of British ships was declared. The movement apparently had its desired effect, and a more

or less united Southern force set out to capture all the Yang-tse ports and then advance on Peking.

Success was achieved at first, and the Southern forces advanced rapidly. Like any other army, however, transport was the great difficulty, and on reaching the Yang-tse, it seemed to the Chinese a natural proceeding to put their troops on board the river steamers and move them down river. These steamers are chiefly owned by British firms, and it was pointed out to the Chinese that, as we were neutrals in this internal war, our ships could not be used as transports.

This was the general situation when in August, 1926, three steamers were forcibly boarded by Chinese troops and collected at Wanshien. The British merchant ship officers of these steamers, s.s. "Wanshien," "Wanlin," "Wantung," belonging to Messrs. Butterfield and Swires, were arrested by the Chinese and kept on board. Furthermore, large numbers of troops were massed on the Bund abreast the steamers.

The British senior naval officer in H.M.S. "Cockchafer" protested against this without avail and the Consul backed up his protests with no result. Another river gunboat, the "Widgeon," was sent to reinforce the "Cockchafer," but even this imposing array of force had no effect. It was then decided to release the British officers, peaceably if possible, but forcibly if necessary.

To this end another river steamer, the "Kiawo" of Jardine Matheson's fleet was rapidly prepared at Ichang. She was armed with machine guns, and manned by five naval officers and fifty ratings, from H.M.S. "Despatch." It was hoped that she would be taken for an ordinary river steamer, and so be enabled to steam alongside the other ships and re-capture the officers. It is probable that the Chinese at Wanshien had been informed by spies at Ichang, however, for additional troops were sent to the captured steamers, and on arrival at Wanshien, the "Kiawo" was received with a warm fire.

The fire was replied to, she steamed alongside the captured ships and effected the release of all but one of the British Officers. The lost one jumped overboard in an attempt to escape, but, unluckily, was drowned. Three of the officers in the "Kiawo," including the Commanding Officer, Commander Darley, and four seamen were unfortunately killed, while two officers and thirteen seamen were wounded.

In the meantime the troops on shore could not fire on the "Kiawo" without hitting their own troops, and so they fired at the British gunboats who replied.

The "Kiawo" managed to haul off and steam away down river with the rescued officers and a few of the Chinese crew who had remained

loyal. The firing by the gunboats had a good moral effect and a few days later the captured steamers were handed over voluntarily without further incident.

After this episode, British men-of-war were frequently fired on by both Northern and Southern Chinese troops from the banks of the river, but a few shells in reply usually dispersed the troops quickly. After the removal of the Russian communist advisers in 1927, this sniping died down.

This incident at Wanshien may perhaps be regarded as a forerunner to the more important events at Hankow in 1926, which, in turn, made it apparent that Shanghai, that is the Foreign Settlements, would shortly be in considerable danger, and this led to the despatch of the Shanghai Defence Force. At the same time additional ships were sent early in 1927 to reinforce the existing China Squadron. These ships were the First Cruiser Squadron, under Admiral Boyle, and the Third Destroyer Flotilla from the Mediterranean, and the Eighth Flotilla from Home.

The First Cruiser Squadron was at first used for the protection of the Southern portion of the station. The destroyers were chiefly employed on the Yang-tse River, where convoy systems had been started to protect our shipping from the assaults of the Chinese soldiers, and also from the attacks by pirates.

ANTI-PIRACY OPERATIONS.

Piracy on the inland waterways and sea coasts of China is as common as banditry or armed robbery is on shore, and may almost be described as an ancient and honourable profession. It is of interest to note that the late generalissimo of Peking, Chang-tso-lin, started life as a bandit.

It is not easy to understand why these pirates are allowed to flourish with practically no attempt to check them on the part of the responsible authorities; it is probable, however, that the Chinese regard them simply as barefaced exponents of the system of "squeeze pidgin," or "graft," which is a universal custom throughout the country.

The root cause of the existence of so many pirates and bandits is to be found in the custom of each Provincial Governor maintaining a large army for the purpose of raiding his neighbour at a suitable moment; should his raid be successful, his army will be paid by the loot they can capture for themselves, but if unsuccessful, he will have to disband them for lack of funds. These erstwhile soldiers then retire to the hills and form robber bands, or reinforce the local pirates.

Piracy is of two types which are usually referred to as external and internal piracies; the former is an attack by pirates in boats at some

suitable spot, and the latter by pirates who gain access to a ship disguised as passengers and then attack when on the high seas. The ordinary external pirate, who operates mostly up the river, is not a very fearsome type of individual.

The internal pirates are of a much more vicious type. Their haunts are in the various villages round Bias Bay and they are divided into two tribes; one attacks the junks which ply between Hong Kong, Macao and Canton by "external" methods, and their base is well placed, strategically, for this purpose. The other tribe are the exponents of internal piracy, and operate on a far larger scale. Their prey is the steamers which carry passengers and trade between the various ports in Siam, Manilla and Singapore and the Treaty Ports on the sea coast. They have a comprehensive intelligence system, and expend considerable sums in organizing a "coup." It is commonly supposed that the real heads of this organization are well-to-do Chinamen resident in large houses in Hong Kong; this theory is always maintained by the Cantonese Government when complaints are made to them. As to the truth of it, I do not know, but certain it is that they are in a position to obtain accurate information of the movement of ships and the nature of their cargoes in plenty of time to send off their pirate gangs. Also, if the pirates are to be believed, the actual gangs who do the work get but a small percentage of the profits, the lion's share going to these nebulous chiefs.

The usual method of procedure is as follows. When it is decided to pirate a steamer, a gang of some twenty to thirty pirates travel to a selected port, at which the steamer will call, and there they board her in the guise of ordinary Chinese passengers. Practically every merchant ship is manned by European officers with a Chinese crew, and by means of bribes or threats to the latter, the pirates arrange for their pistols and ammunition to be smuggled on board.

Once at sea, the pirates get hold of their arms, and waiting a suitable opportunity, they divide into gangs and rush the bridge, the engine room, the officers' mess and the W/T office. Having gained control of the ship they order the Captain to steer for Bias Bay, and guard him night and day to see that he does not communicate with any passing ships.

During the passage to Bias Bay, the pirates systematically rob officers and passengers of all valuables and clothes. They then sort out the Chinese passengers to find out which of them are worth holding to ransom, and they generally torture these unfortunates to extract information as to their financial status. On arrival at Bias Bay, or another landing place in the vicinity, a pre-arranged signal is made and numbers of junks come alongside the steamer. The cargo, valuables and selected

passengers are transferred and then the steamer is released to proceed to Hong Kong. The luckless prisoners are either kept by the pirates until ransomed, or sometimes they are put up to auction in the local villages.

So long as pirates confine their attentions to their own countrymen, we have little to say, but when steamers flying the British flag are molested, interference on our part is essential.

Many diplomatic notes have been addressed to the authorities at Canton, requesting them to take steps to stop the piracies, with no result at all. Finally, they may be warned that if they do not move in the matter we will take action for ourselves. The only diplomatic difficulty lies in the fact that Bias Bay is outside the leased territory, and we have no jurisdiction there at all. There is also the fact that up to the present there has been no recognized Government in China to whom we can apply for compensation.

Normally the total loss as the result of a piracy is the cargo and the personal effects ; but if any active opposition is put up by the officers, the pirates shoot them down and the same fate awaits any European passengers, after which the ship is set on fire. The same result occurs if a man-of-war closes to investigate. This happened in the cases of the "Tai-on" in 1914, the "Sunning" in November, 1926, and the "Irene" in 1927.

Opposition, therefore, not only endangers the lives of all Europeans, but also entails a much greater financial loss in the destruction of the ship. From this point of view shipowners are averse to their officers being armed, and it is not an easy matter for a man-of-war to capture a pirated ship without loss of life and large financial loss to the owners.

Much time has been spent in trying to devise methods for preventing these internal piracies, and various schemes have been tried, such as the examination of all passengers by detectives at embarkation, the provision of armed guards for all passenger ships, and the erection of grilles to prevent access from second or third class passengers to the bridge and engine room ; but these have all failed for various reasons.

Finally, it was decided to attack the pirates' lair, and the Chinese authorities were warned that this would be done in the event of another piracy. A great deal is known about the Bias Bay gang and their haunts, the information being collected by the Hong Kong Police detectives, an excellent body of Hong Kong Chinese under English management.

THE BIAS BAY EXPEDITIONS.

First Expedition.

On the 22nd March, 1927, the C.N.C. steamer "Hop Sang" was

pirated and taken to Bias Bay. It was decided at once to carry out the scheme of retaliation, and an expedition under the command of Rear-Admiral W. H. D. Boyle proceeded to Bias Bay, where two villages were sacked and a large number of junks were destroyed.¹

The effect of this was salutary, at any rate for a time, for no British ship was pirated for some months, although one or two others were attacked.

Second Expedition.

On the 29th August, however, the s.s. "Yat-shing," of the Indo-China S. N. Co., was pirated, and a second expedition was carried out. H.M. ships taking part were the "Hermes," "Danae," "Foxglove" and "Sirdar." Additional seamen and marine platoons from H.M. ships "Despatch" and "Tamar" were embarked in the "Danae," also a section of the Hong Kong Police Force. The force sailed from Hong Kong and arrived at the head of Bias Bay at about 8 a.m., on the 1st September. On account of the depth of water, the "Hermes" and "Danae" anchored at the entrance to the creek leading to Fan-lo-kong village some seven miles away. The platoons were then embarked in boats, and towed for about five miles by the "Foxglove" and "Sirdar," finally pulling into the selected landing place.

In the meantime the aircraft-carrier, "Argus," on passage to Shanghai, had been recalled, and on arrival in Bias Bay sent further reinforcements, bringing the total number landed up to five hundred. The actual landing was difficult as the water shallowed to such an extent that the boats grounded a hundred yards from the beach; the men then had to wade through very soft slimy mud.

Opposition to the landing was expected, and aeroplanes from the "Hermes" and from Hong Kong carried out a reconnaissance; but the landing was effected without incident. The first village to be dealt with, Chuen-pi, lay about a mile and a half from the landing place. The country consists of paddy fields and salt-pans, intersected by muddy creeks, and the only roads are narrow footpaths which entailed marching in single file. At the entrance to the village the "elders" were assembled, and they were informed that we had come to burn the houses of certain pirates known to live there, that this was being done as retribution for the recent piracy of the s.s. "Yat-shing," and that if the required houses were not pointed out to us the whole village would be burnt.

The elders at first refused to show the houses, and so a start was made to burn the village. Subsequently, one or two of the required

¹ An account of this expedition appeared in the *JOURNAL* of May, 1927, page 421.—EDITOR.

houses were shown and duly demolished. All the men of the village had cleared out on our approach, only the women and animals being left, and some difficulty was experienced in keeping these from being burnt, but happily there were no casualties. Every care was also taken to avoid damage to joss houses.

Time was of considerable importance, as the force had to be re-embarked not later than an hour and a half after high water, as after this boats could not approach within a reasonable distance of the shore. So, after an hour's incendiary work on this village, the force was withdrawn and a rapid march made to the next village, Fan-lo-kong, situated about two miles from Chuen-pi.

Fan-lo-kong was a much larger place and was said to contain some 5,000 inhabitants, but on approaching it the male population could be seen assembled on a hill well outside the village. The elders at this village had observed Chuen-pi burning and were far more amenable. After a short parley they agreed to show the houses of the pirates, whose names were on a list in the possession of the Police. About five of these were burnt down; they were well-to-do houses, obviously fitted out from the loot of various piracies. In the meantime a demolition party destroyed all the large sampans or boats lying in a creek leading from the village to the sea; these were obviously used for conveying loot from the junks to the village. Time did not permit of all the houses on the list being dealt with, and the force was withdrawn to re-embark. In the meantime the motor boats had searched for and captured five large junks, which were blown up after the crews had been removed.

On leaving the village of Fan-lo-kong, the elders conveyed to me, through the Commissioner of the Hong Kong Police, an expression of their thanks that the village itself had been spared.

The re-embarkation entailed considerable wading through the mud, due to the falling tide, and the boats had to be kept further from the shore. The last men had some 300 yards to cover, up to their knees in mud, some of them staggering under the weight of Lewis guns, demolition charges or other burdens.

Third Expedition.

In October of the same year information was received of another pirate gang having left to board a steamer. It was decided to try and intercept them before they could reach Bias Bay. To this end a submarine patrol was sent, on 18th October, to watch the approaches of that inlet, and about 8 p.m. on 20th October, submarine "L.4," commanded by Lieutenant-Commander Halahan, sighted a vessel without lights. This proved to be the "Irene," a steamer belonging to the China Mer-

chants' Steam Navigation Company. The ship was found to be already in the hands of the pirates. A warning shot across the bows failed to stop her, but one or two well directed shells had the desired effect. "L.4" went alongside while fierce fighting was going on in the "Irene." Fire broke out, and the Chinese passengers, in a panic, jumped into the sea. Most of them were saved by the submarine, which also rescued all the European officers. The ship sank before she could be towed into port. Among the rescued passengers seven pirates were identified and, after trial at Hong Kong, were executed.¹

CONCLUSION.

I hope I have made it clear that the principal work of the Navy in the Far East is the protection of trade. That is the chief function of the Service in all parts of the world both in peace and in war; but in China the work is of an unusual character, due to the peculiar nature of the Chinaman, who lags so far behind modern civilized methods. The duties are not likely to be less arduous in the future, and many complex questions are bound to arise while China goes through her period of regeneration.

It is the experience of history that after a great war the nations toy with the idea of perpetual peace, and the aftermath of the recent war is, certainly no exception in this respect. Proposals for disarmament are rampant, and there are many who erroneously regard the League of Nations as a preventative, whereas its functions, at best, can only be deterrent.

If we consider the whole world, we find the inhabitants divided broadly into black, yellow and white races, and numerically, the coloured races far out-number the white. The superiority of the white civilization over the coloured races lies not in man-power, but in our advanced science and the weapons that science has evolved. If we forego these superior weapons, we place ourselves in a position of inferiority. The Chinese provide a practical example of the effects of disarmament—they still used bows and arrows in 1850. As a result of their experience they are now employing Westerners to create an efficient army for them. When, and if, that is accomplished—and when, and if, the present attempts at re-organization, generally, are successful—we shall be faced with a nation of 400,000,000 behind that army.

¹ Subsequently the Chinese owners of the "Irene" brought a suit against Lieutenant-Commander Halahan for £53,000 damages for wrongful sinking of the ship. The defence pleaded "act of State" and the Court found for the defendant.

Let us hope by all means that our relations with China, and other nations, will in the future be amicable, but by no means let us neglect preparations for the reverse.

There was no Discussion.

THE CHAIRMAN.

As nobody apparently desires to make any remarks on this interesting lecture there is nothing for me to do but to touch on one or two points.

The lecturer told us that Sun-Yat-Sen asked for the assistance of the Russians, with the result that we had the honour of being picked out as being the principal enemy of China. How artificial that all was is proved by the fact that Sun-Yat-Sen asked for British officers before he turned to Russia. The policy of H.M. Government, however, was to be neutral, so that we forewent the great advantage we might have had by appointing Britishers to conduct the Nationalist movement.

The lecturer also stated that the Navy is always on a war footing in Chinese waters; to a great extent that is true. The gunboats are commanded by comparatively young officers who have to carry on miles away from any support, and on these officers and the decisions they make great issues may depend. He described certain incidents that took place. One I wish that he had had time to refer to occurred at Nanking which showed how, even in these days of wireless, officers in China are thrown on their own initiative and have to decide in a moment how to act. This episode took place when the Nationalist Army was coming in and the soldiers got out of hand and looted the town; the British Consulate was attacked; the British Consul-General was wounded and two British officers were shot in cold blood; many others were wounded and the women and children were left in the hands of the Chinese soldiery; the Americans and the British mustered at Sacony Hill. Only then did Captain England of the "Emerald" take the very weighty decision, backed up by his American colleague, to open fire. How many rounds they fired I do not quite know; it was not many but it had a beneficial and a far-reaching effect; not again did the Nationalists attempt to molest British subjects under the very guns of a British man-o'-war.

The lecturer and myself were visitors to China during a most interesting period, and we saw enough to realize the wearying conditions which those who served there had to put up with. A man may go to China with a great reputation and lose it; a man may go to China with no reputation and gain one; or a man may go to China with a great reputation and still further increase it. There is no better example of the last category than the Commander-in-Chief out there at the moment.

The customary votes of thanks to the Lecturer and Chairman were accorded by acclamation.

AIR CO-OPERATION WITH THE ARMY

By FLIGHT-LIEUTENANT JOHN A. McDONALD, R.A.F.

THE Army training season of 1928 was indicative of still further development in the co-operation between Army formations and their affiliated Royal Air Force squadrons. This is but the natural consequence of the very close liaison now existing between the respective units and formations concerned.

It is now a regular practice to hold Royal Air Force tactical exercises for the benefit of selected Army officers during the winter months, with the object of instructing such Army officers in the duties of the Squadron Intelligence Liaison Officer and the Squadron Artillery Officer,¹ in order that they may appreciate the work these officers would be called on to perform in war. They are also familiarized with the tactical handling of Army Co-operation aircraft and, what perhaps is most important of all, in the correct method of issuing orders and instructions to the Royal Air Force.

Another important object is the promotion of good relations between the Army and R.A.F., as well as the growth of air-mindedness in the Army itself, which is encouraged both by liaison with the R.A.F. and by the universal growing interest in the development of civil flying. Ten years ago Army officers had little opportunity for flying unless called on for some special duty and the event was, even so, something in the nature of a "stunt." To-day things are different.

Officers nowadays frequently travel by air both on duty and pleasure. An officer may have acquired his first experience of the air when he was still at school and a member of his O.T.C. Most public schools have R.A.F. squadrons affiliated and aircraft are available when the O.T.C.

¹ Intelligence Liaison Officer replaces the title of Branch Intelligence Officer. This officer will in future be recognised by a red band on one arm with the letters I.L.O. Both the I.L.O. and the S.A.O. are selected Army officers who have qualified after short courses at the R.A.F. Schools of Army Co-operation and Photography.

are in the camp both for schemes and for promoting interest in aviation. Flying is only permitted to boys whose parents have consented to that practice. Over 150 boys were taken for flights this year from the units in camp at Mytchett.¹

A small number of officers have graduated as flying members of light aeroplane clubs and a few are actually owners of their own machines. For example, it was recently stated in the daily press that the officers of the Household Brigade proposed forming their own flying club at Brooklands.

In the Army there also exists a number of officers who return to regimental duty on completion of a period of four years seconded service with the R.A.F. During this period of four years, each one will have flown under normal conditions about five hundred hours. If he has served in an Army Co-operation Squadron which is his proper *métier* in the R.A.F., he will be fully qualified in the various duties of the Army Co-operation pilot, in close reconnaissance, artillery reconnaissance and medium reconnaissance. He may have acquired, in addition, a certain amount of technical knowledge of say, armament, W/T, or photography. He certainly returns to the Army with a sound appreciation of the various tasks aircraft can carry out and how they can best be employed in co-operation with the Army.

It might be added that the development of mechanization in the Army will bring the personnel of the two Services into closer contact and relationship, since they will both be concerned in the knowledge and maintenance of petrol engines. This, however, may be regarded as more problematical.

The outstanding fact is that there now exists in the Army a reasonable percentage of officers with some first-hand experience of flying and consequently a fair knowledge of the capabilities and limitations of aircraft in general. This percentage will presumably increase as flying, particularly flying on a light aeroplane basis, becomes more popular. The above facts, coupled with the assurance that Army and R.A.F. staff officers will get increased facilities for joint employment on schemes and tactical exercises, seem to ensure a bright future for co-operation in general between the two Services.

I.—SOME OUTSTANDING PROBLEMS OF THE 1928 TRAINING SEASON.

(1) *Protection of Aerodromes and Advanced Landing Grounds.*—It is accepted as a general rule that the commander of any military force

¹ The story is told that one boy from Aberdeen had the usual permission in writing from his parents allowing him to fly with the proviso "that it should incur no expense."

to which aircraft may be assigned for work in the field will be entrusted with the task of ensuring the protection and security of those aircraft, both when at rest and on the move.

During the Great War when conditions of static warfare prevailed, this did not amount to a very heavy responsibility, and aerodromes were usually well outside the enemy's artillery range. Nevertheless, during the German offensive of 1918, when some aerodromes came under fire and had to be evacuated hurriedly, the consequent results on Air lines of communication were distinctly disconcerting.

Under present day training conditions, the main aerodrome may still be thirty miles behind the fighting troops and well outside the danger zone, but it is now a generally accepted principle that Army Co-operation aircraft will normally operate not from their main aerodrome but from an advanced landing ground. This miniature aerodrome would be sited reasonably close to, say within five miles of Division or Corps Headquarters.

The reasons for having an advanced landing ground at all should perhaps be explained, since these landing grounds on anything like the scale now contemplated were unknown during the Great War.

The information a pilot sends down by R/T or W/T during his artillery and close reconnaissance patrols is supplemented by statements subsequently made to the Intelligence Liaison Officer on the ground. His messages from the air are necessarily disjointed, referring simply to what he sees taking place in his area at any particular moment. If he concentrated for any length of time on the movements and dispositions of enemy troops in one sector only, it would be at the expense of knowing what was taking place in other, and not necessarily less important, sectors. The pilot's task, therefore, is to grasp the details correctly and thus enable the Staff Officers at Division or Corps and his own Intelligence Liaison Officer at the Squadron Headquarters to build up the picture.

Good communication between landing ground and the Army Headquarters is thus essential. In certain cases, the Army staff may wish to instruct or to interrogate a pilot personally. The Intelligence Liaison Officer and the Squadron Artillery Officer will certainly have to pay frequent visits to the headquarters of the military formation with which the squadron is working not only to give their summaries of Air information but to keep in close touch with the commander's appreciation and intentions. Even if a reliable telegraph and telephone cable could be guaranteed between Army Headquarters and the main Squadron aerodrome twenty to thirty miles away, it would not meet all requirements. Again, it would be quite impracticable, in time of

war, for the R.A.F. Commanding Officer, or his Intelligence Liaison Officer, to make frequent return journeys over such a distance as thirty miles.

The advanced landing ground is therefore the R.A.F. battle headquarters from which aircraft will operate between the hours of dawn and dusk. On that ground there may also be a few vehicles in attendance for conveying petrol or rations, loading up aircraft with bombs and ammunition, and probably such technical equipment as is necessary for the interception of W/T messages.

Such a landing ground cannot be easily obscured from enemy observation from the air, balloons or high ground, and its location will therefore certainly be known to a well-equipped enemy. So there arises the problem of its protection. The R.A.F. mechanic can handle a rifle and look after himself, but he is a tradesman first, and a trained combatant second. To employ him on guard or picquet duty means that he is non-effective in his proper rôle.

Moreover, if armoured fighting vehicles of the future are capable of raiding up to a radius of fifty to sixty miles, the advanced landing ground offers a good objective to a mobile force, especially at night when 50 per cent. of the squadron aircraft may be preparing for the next day's work.

(2) *Air Umpiring*.—Once again the lack of a simple and efficient method of air umpiring has been evident throughout the 1928 training period. There are two headings under which air umpiring may be considered apart from anti-aircraft gun fire :—

(a) Direct action by aircraft against ground forces using bombs and machine guns, and, vice-versa, action against aircraft by rifle and machine-gun fire ;

(b) Indicating to troops on the ground that artillery fire has been brought to bear on them as the result of air observation.

(a) applies to bombing aircraft, bombing probably from high altitudes, low flying fighters specially detailed by the commander for attacking favourable ground targets and, to a lesser extent, reconnaissance aircraft.

(b) applies to reconnaissance aircraft only.

(a) becomes more important yearly as ground units continue to improve their anti-aircraft measures. Attacking troops to-day is a very different matter to what it was eight years ago. Units now conform to a definite drill when attacked from the air and what appeared from 3,000 feet to be a good target, such as a battalion in column of route and on the move, may suddenly develop into an avenue of rifles when attacked, resulting in controlled flanking fire being brought to bear on the aircraft.

In view of these present day anti-aircraft measures adopted by infantry, the attack of ground troops is a branch of air tactics demanding high skill in manœuvring and handling of aircraft. Single-seater fighters are the most effective aircraft in this role and surprise in attack continues to be their chief asset. Of course, during manœuvres and in the excitement of the moment it is inevitable that both sides should make exaggerated claims for their efforts. The pilots frequently claim to have "shot up" and bombed the infantry, while the troops may claim to have shot down practically all the planes. It is not always possible to arrange for an umpire to be on the spot and give a well-balanced verdict.

In the case of bombing aircraft, flying at high altitudes, say 8,000 feet, the difficulty is to convey to ground umpires the information that bombing is being carried out. Visual signals such as lamp flashing or lighting of flares are, in practice, rarely observed from the ground. If a bomber comes down to about 500 feet to drop a message on his target, it is at once claimed, and perhaps rightly so, that he has been shot down by ground fire.

The problem with regard to (b) is not so difficult, and progress has been made towards its solution. In one Divisional Artillery umpires were given facilities for intercepting W/T zone calls from artillery reconnaissance aircraft calling for fire on favourable targets. Such intercepted calls, combined with copies of artillery orders for the exercise and a good knowledge of the scheme, should assist umpires in assessing casualties.

Cases will often occur when umpires are not present and no credit can be given for air action. Thus, for instance, during one divisional exercise this year, a pilot engaged on a dusk artillery reconnaissance observed a column of thirty enemy M/T lorries proceeding slowly along a main road and obviously making good use of any available cover.

This very favourable target was engaged by a medium battery and fire for effect carried out with air observation. It was later learned that no umpires were in the vicinity of the lorries and no casualties given. In this particular case, the pilot came down low and flashed an Aldis lamp on the lorries to indicate they were being shelled, but it is questionable if the drivers understood what this meant.

(3) *Communications*.—In war, it is the responsibility of the Army to provide land line communication and despatch-rider services between the aerodrome and headquarters of military formations. This presumably now embraces the advanced landing ground. During the 1928 training period, such facilities were rarely provided, but in some cases civil telephones and two-way W/T sets were substituted.

If the R.A.F. Squadron Commander and his Intelligence Liaison Officer are not in telephonic communication with the affiliated headquarters of military formations, they are at an obvious disadvantage. They will not be in touch with the immediate development of the commander's plan, and they cannot pass on information revealed by the pilots on completion of their patrols, which, in order to be of use, must be given to the staff without delay.

The use of an advanced landing ground situated close to headquarters of military formations will greatly minimise this difficulty of telephonic communication. In any case it will decrease the distance over which the line has to be laid.

While a land line connecting the main squadron aerodrome with the headquarters of the military formation is hardly to be expected in conditions of mobile warfare, it is imperative to have a line installed to the advanced landing ground.

(4) *Night Reconnaissance.*—Army Co-operation Squadrons carry out night flying as part of their annual training programme, and all pilots in the Squadron are required to become proficient therein. Night reconnaissance was not carried out during the training periods of 1928. To observe any detailed movement at night involves the dropping of parachute flares designed to light up an area of about 500 yards radius. These flares are packed in containers which drop free to earth and therefore constitute a danger to ground personnel. On manoeuvres, therefore, harmless substitutes have to be employed. In any case, at night, vehicles with headlights and trains can be seen clearly from the air without the use of flares.

In war, night reconnaissance will probably be called for by the force commander. The problem then arises as to what units will carry out these night reconnaissances. Army Co-operation Squadrons are already fully employed from dawn to dusk, and their establishments of machines and personnel do not permit of the additional strain which night reconnaissance would undoubtedly entail. Night flying aircraft, on the other hand, are usually bombers and not designed for easy manoeuvring at the ordinary reconnaissance heights, while, in any case, their primary role in a theatre of war would be bombing favourable targets normally found well behind the actual zone of active operations.

Quite apart from the value of any information obtained, there is the moral effect of flying over the enemy by night. This will be particularly the case when major movements are made by the enemy at night with the object of securing concealment from the air.

II.—EMPLOYMENT OF ARMY CO-OPERATION SQUADRONS WITH EXPEDITIONARY FORCES.

On two occasions since the Great War, Army Co-operation Squadrons have been despatched from their permanent aerodromes in England or Egypt to serve as units of small Expeditionary Forces. The first occasion was in 1922 when one Squadron from Egypt and one from England were sent to Turkey to form part of the British Forces in occupation of Constantinople and Gallipoli. No. 208 (A.C.) Squadron was located at San Stefano aerodrome, Constantinople, and No. 4 (A.C.) Squadron at Kilia-Bahr on the Gallipoli Peninsula. The second occasion was in 1927 when No. 2 (A.C.) Squadron was despatched to China to form part of the Defence Force at Shanghai.

It is not without interest to consider the conditions under which these Squadrons worked and the duties they were called upon to carry out. We may thus try and deduce how far these overseas conditions are consonant with those prevailing at home during the training periods.

It must be appreciated that R.A.F. squadrons cannot be embarked for duty overseas at a moment's notice. A certain unavoidable delay is necessary in order to complete a squadron to its war establishment of materiel and personnel. In the case of the squadron sent out to China, over two months elapsed between the despatch of a request for a squadron and its actual arrival in the Shanghai area.

At Gallipoli in 1922, and again at Shanghai in 1927, the aircraft available in the early stages were the seaplane flights of H.M.S. "Argus." In both instances one flight was disembarked and operated from a shore base. At Gallipoli, the seaplanes remained fitted with floats, but at Shanghai the floats were changed for wheels and the flight employed as land machines from a temporary aerodrome within the settlement.

It is imperative to note that the seaplane flights in question formed part of the aircraft carrier's complement of aircraft and consequently were not self-supporting when shore based. Their ancillary services, i.e., their transport, accommodation, rations, and medical arrangements were arranged for by the Army staffs concerned. It is not unreasonable, therefore, to assume that in future small campaigns, similar to these referred to, the Force Commander may be dependent on carrier-borne aircraft until the Army Co-operation Squadron arrives from its permanent base. The time taken for the A.C. Squadron to arrive in the area of operations and begin working will necessarily depend on the geographical position of the area of operations relative to the nearest available A.C. Squadrons. Further, it does not follow that, as in the case of the Shanghai Force, the nearest A.C. Squadron can always be spared. A squadron had to be sent out to Shanghai from England, not from India or Egypt.

A situation may thus arise when a naval observer has to carry out strategical and tactical reconnaissance for the commander of a military force. This may happen at a time when air information is of great importance. At Chanak, for example, in 1922, the seaplanes of the "Argus" carried out reconnaissances well inland to get information about the strength and disposition of Turkish forces then advancing towards the Straits. Again at Shanghai in March, 1927, when it was uncertain what movements of Chinese troops were taking place outside the area of the International Settlement, the seaplanes were held in readiness to carry out such tactical reconnaissance as the Force Commander should desire. It was to facilitate this task that they were shore based and temporarily employed as land machines.

In the light of experience gained it can, therefore, be said that Army Co-operation aircraft will not always be available to a military commander overseas.

RECONNAISSANCE AREAS.

In F.S.R., Vol. II, it is stated that "A Military Commander with aircraft at his disposal is responsible for obtaining information on all matters which primarily affect his immediate plans."

During training periods at home, reconnaissance areas are usually defined to within a few miles, and pilots are often given boundaries to mark on their maps outside which it is known definitely that troops will not be found. This may not be the case, however, overseas when the enemy has first to be discovered before his strength and disposition can be later reported on. At Constantinople in 1922, the first area given for reconnaissance was West of a line running from Ismid on the Gulf of Ismid to Shile on the Black Sea. Reference to the map will show this to include a very large area. At Shanghai in 1927, very little was known about the movements of any Chinese Nationalists or other forces around the International Settlement, and it would certainly have been difficult to lay down definite areas for reconnaissance.

GENERAL EMPLOYMENT OVERSEAS.

Under the conditions prevailing at the time at Constantinople, Gallipoli and Shanghai it was inevitable that the three Services should be in close touch with each other in questions of tactical employment. The squadrons in Turkey, for example, did, on occasions, perform in addition to their ordinary routine such duties as :—

- (1) Spotting for full calibre and sub-calibre firing exercises at sea.
- (2) Spotting for land bombarding exercises carried out by battleships of the Mediterranean and Atlantic Fleets.

- (3) Practising tactical reconnaissance and dummy runs on imaginary fleeting targets for battleships exercising from their allotted berths.
- (4) Fleet anti-aircraft exercises.
- (5) Observing during torpedo exercises.
- (6) Combined operations signal exercises.

The bombarding exercises were carried out in the Dardanelles area and were particularly interesting. The reader will, no doubt, agree that no setting could have been more appropriate in which to test the progress made in firing at land targets with air observation.

The target was a ruined stone cottage, probably a relic of the original bombardment. It was situated about $2\frac{1}{2}$ miles South of Gaba Tepe close to the sea. The ships lay off the Asiatic coast in the vicinity of Kephez Bay. The range was approximately 17,000 yards and the line of flight about half way between Kilia Bahr and Achi-Baba.

The firing was watched from the air by several naval officers flying in spare machines, and the results obtained caused general satisfaction.

Naturally these exercises were much appreciated by the Army Co-operation pilots to most of whom the experience of taking part in naval and combined exercises was quite unique.

At Shanghai there was not the same scope for the employment of the Army Co-operation aircraft. The facilities for flying were very restricted and there was no scope for combined operation exercises.

CONCLUSION.

To simulate at home such conditions as prevail in practice overseas is almost impossible, but it is worth while bearing in mind that these conditions may exist again, and that aircraft may be called upon in future to perform duties other than they normally perform during their summer training with the Army.

BATTLESHIP LIFE IN THE EARLY EIGHTIES

By LIEUTENANT COMMANDER H. H. PAYNTER, R.N. (Emergency List).

THE Early Eighties! Those of us who remember them as young men will, I think, agree with me that they were good times. Then one could get a good glass of beer for 2d. and an ounce of tobacco for 4d. We were untrammelled by legislation which has since made us slaves to bureaucrats, and England was indeed a free country!

We, who were young men then, have had an extraordinary experience in the last fifty years. We have witnessed wonderful discoveries: telephones, motors, wireless, submarines, aeroplanes, etc.—indeed, it is doubtful whether any period of fifty years in the world's history has been more fruitful in change, or more prolific in invention. The Navy has, of course, kept pace with the general advance, and to those who are familiar with the modern battleship—that wonderful engine of destruction costing £5,000,000, consisting of a mass of intricate machinery, manned by a collection of scientists and experts—it may be interesting to turn back fifty years and contemplate a vessel which was in her day considered to be the last word in capital ships.

In the Early Eighties we did not call them "battleships," they were "ironclads," and were really the last phase of the old broadside type. The writer was privileged to serve in the "Northumberland," which was one of the old Channel Fleet. This consisted for a long time of the "Minotaur," "Agincourt," "Northumberland" and "Achilles," an imposing fleet as it was then considered, so much so that, although there were only four ships, two Admirals were required, a Vice and a Rear, whose flagships were the "Minotaur" and the "Agincourt."¹

The "Northumberland" was armed with twenty-seven heavy guns, twenty-two of these being 8-inch nine ton, and the remainder 9-inch twelve ton; all muzzle loaders with studded projectiles, whose velocity was such that their flight could often be traced by the eye. Twenty-two guns were situated on the main deck, all hand worked of course. Usually they were fired by friction tubes, but there were also electric tubes which could be fired from the conning tower for what was called director firing,

¹ A coloured frontispiece depicting the Channel Fleet about this time appeared in the JOURNAL for May, 1925.—EDITOR.

when the individual guns were trained to marks on the racers. A small scuttle in the port enabled the hand rammer to be operated, the port itself being triced up, and the guns run out, when they were to come into action.

"General Quarters" was an elaborate evolution. Masts and yards were sent down, the bowsprit run in, and all hands repaired to their respective stations. Some were armed with boarding pikes, and, as these were rather dangerous things to charge about the ship with, the instructions were that the thumb was to be placed on the point, so that, if anything or anybody was run into, it was the bearer of the pike who would suffer. I was interested to hear, from an Admiral who took a prominent part in the late war, that at his request boarding pikes had been supplied to his ships, as they were found so useful for protecting paint work, marking out football grounds, etc.

The remaining armament of the "Northumberland" consisted of some Nordenfelts on the bridge and a battery of saluting guns on the upper deck. The Nordenfelts provided a little excitement on one occasion at "General Quarters." The Staff Commander was in charge of the bridge, and thought he would investigate them, as they were new to him. He therefore drew back the firing lever, with the result that charges dropped down into place. He then advanced the lever, firing all four barrels and actually hitting the flagship. The saluting guns were of brass, mounted on trucks. They were the great pride of the gunner, who was at his best when firing salutes. Being of the old school he scorned a watch, and timed the salute by the ancient formula :

"Number one Gun, Fire!" (Bang), then :

"If I wasn't a Gunner I shouldn't be here ;

"And I shouldn't be called the son of a —

"Damn! Blast! Fire!"

and so on.

These words, if repeated slowly, will be found to occupy just ten seconds, the correct interval between successive discharges.

Two above-water torpedo tubes, from which torpedoes could be discharged by means of compressed air operating impulse tubes, were situated on the main deck. The torpedoes were, of course, without gyroscopes or heaters ; very little reliance could be placed on the direction they would take on striking the water, or where they would eventually finish their career.

On the quarter deck was an imposing conning tower, or perhaps I should call it "citadel." From here the Captain could control the ship by a steam steering wheel and engine room telegraphs, and communicate with the battery by means of voice tubes. Loop holes were provided

so that, in the event of the ship being boarded, the invaders could be subjected to rifle fire. Telephones and fire-control instruments were, of course, non-existent.

The battleship, or "ironclad," of the Early Eighties was not a fast ship; indeed no one wanted speed. The whole idea was to cruise economically, using sail on every possible occasion. Our average cruising speed was probably three knots, but I have often recorded 1.8 when I hove the hand log as Midshipman of the Watch. When we went full speed it was indeed an event, and we used to look over the side with awe as the water rushed by at ten knots!

Originally the "Northumberland" had five masts, like the "Minotaur" and "Agincourt," but these were subsequently reduced to three, the sails and spars being increased in size.

Whenever possible, fore-and-aft sails were set and, as soon as they would draw, the square sails. They certainly helped the ship along, but by themselves were very little use except with a gale of wind, and that well aft. With this we could make eight to nine knots under sail alone, but on a wind, without steam, nothing could be done; the ship would come right up into the wind and stay there, and no attempt to get her to pay off, by bracing round the head yards, was the slightest use.

Every evening some evolution took place; but the greatest "picnic" I ever witnessed was when we had been steaming against the N.E. Trades, and suddenly between some islands got a slant of fair wind. The signal was made "Make all possible sail." Our top-gallant masts were on deck, also the topsail yards; and the lower yards and topmasts were struck. From this state of things we had to blossom out into studdingsails both sides. Not many of the younger naval officers of the present day will realise what this meant and entailed; suffice it to say that the evolution *was* performed, and that the time taken was thirty-two minutes.

Masts and yards died hard, and to the great regret of those who were brought up with them. They engendered a most extraordinary spirit of pride and emulation in the fleet, and produced a fine athletic type of man, in spite of the fact that the food for the Lower Deck was of a very scanty nature. Cocoa and biscuit for breakfast; salt beef, or pork, or "Fanny Adams," etc., for dinner; and tea and biscuit for supper. That was all, except for the half gill of rum at "one bell," and lime juice in the tropics. Canteens were beginning to be discussed, but were very rare.

It seems difficult to imagine how a modern battleship could exist without electric light, but we had none in the days of which I write. The officers' quarters had oil lamps, but the main lighting of the ship consisted of large candles with double wicks, hung in containers on gymbals in large lanterns.

Our anchors were five tons. They were usually weighed by the hand capstan although we had a steam one, and the men used to heave round merrily to the band playing "When we get back to Plymouth Docks," or some equally well-known tune. Then, when the anchor was up to the hawse pipe, "Man the Cat"—a threefold purchase. The fall was led right along the deck, through two snatch blocks, one on each side of the break of the poop, and back forward along the other side of the deck. All hands stepped out to the band.

Everything, whenever possible, was done by hand. We had a steam derrick for getting out the boats, but I never saw it used.

The steam capstan *was* used sometimes, and I well remember the first occasion. It was a very precious piece of machinery, and a skilled Engine-room Artificer was sent on to the forecastle to manipulate the starting wheel. This he did very deliberately, starting slowly and running steadily. Such methods did not suit the energetic Second Lieutenant, who, in the absence of the First Lieutenant was carrying-on. He displaced the E.R.A., putting a trembling young Ordinary Seaman in his place. "Now, my lad, when I say 'Heave Round,' you put the wheel hard over." The latter did so. The old Scotch Chief Engineer had been watching over his brand new 40-h.p. capstan engine; he now poked his grizzled head up the fore hatch. "Man, man, you're tearing the b—y thing up by the ruits!"

Life on board had its humorous interludes. I remember that during one evolution, the Commander, who was not pleased with the work aloft, hailed the Captain of the Main Top: "Main Top there, Main Top, you're about as much d—d good up there as I am down here"—a remark which was capable of a different interpretation from that which the gallant officer intended.

Those days are passed, and we now have machinery and science everywhere; nevertheless the grand old spirit still prevails. The Navy always was "going to the dogs"; it was in Nelson's days,—but it has not got there yet.

MODERN ARMIES

A LECTURE BY GENERAL VON SEECKT, OF THE GERMAN REICHSWEHR.

(Published with permission of the General Staff.)

This lecture was delivered in Berlin on 3rd April, 1928. The importance of its contents, combined with the character and career of its author,¹ seem to warrant its reproduction in full.—EDITOR.

THE following ideas represent my private personal opinion, and are devoid of any official character, even though such might be read into them after a consideration of my past career. They are also totally unconnected with conditions now prevalent in the German Reichswehr, being purely fanciful conceptions untrammelled by the fetters of the Versailles Treaty. Finally they are entirely confined to land operations and leave naval questions to be dealt with by experts.

In order to sketch out my subject more definitely I should like to put forward, and if possible to answer, the following questions: What is the present trend of military development? Are armies still necessary? What will they look like? How will they operate? The fancies to which I shall here give free play are therefore deduced from very real actualities. But I am not blind to the dangers of prophecy.

¹ General von Seeckt's career is as follows:—He was gazetted in 1887 into the "Kaiser Alexander" Garde Grenadier Regiment. On mobilization in 1914 he was then a Colonel and Chief of Staff of the IIIrd Army Corps which fought against the British. Early in 1915 he was appointed Chief of Staff to the XIth Army under Mackensen, who was shortly to inflict a severe defeat on the Russians. He then became Chief of Staff to the Army Group which over-ran Serbia, and afterwards Chief of Staff to Tsar Ferdinand of Bulgaria. In 1917 he became Chief of the Turkish General Staff, which post he held until just before the Armistice.

When the Kapp Putsch occurred in 1920 and the Government fled from Berlin, von Seeckt was made temporary Commander-in-Chief with full powers to restore order. This he did without firing a shot. Afterwards he was appointed Chef der Heeresleitung, which post he held until his resignation in October, 1926. During this period he was responsible for the complete reorganization of the German Reichswehr.

In order to establish a definite starting point, let us first briefly glance at those armies which took the field in the World War. In doing so we come to the astonishing conclusion that all of them were more or less insufficiently organized for the purpose. Comparisons are simplified by the fact that the Great Powers of the Continent of Europe had based their defence systems on the principle of universal service, and that all in common endeavoured to deploy their armies on their frontiers both very rapidly and numerically as strong as possible. The brilliant achievements of the German organization need not be stressed here, but three cardinal mistakes may be pointed out. In spite of the universal conviction that a war would be a matter of life or death to Germany, and in spite also of the fact that, at any rate in military circles, we reckoned on a war on two fronts, that is to say with a numerical superiority on the part of the enemy, our national resources were not fully exploited from a military point of view and universal service was not carried through to its full extent. For sustaining the struggle, that is, for maintaining our necessary reserves, neither sufficient nor adequate material was provided, and by the same token actual economic mobilization did not exist. We owe it to the foresightedness of Walter Rathenau and to the perspicacity of the War Minister, Falkenhayn, that, after the outbreak of war at any rate, the necessary measures were taken to hold out economically. Everything had been risked on the strength and rapidity of the first blow, although Schlieffen had warned us by pointing out the possibility of another Seven Years' War.

France exploited her man-power thoroughly, as well as that of her colonies. On the other hand, her material equipment proved insufficient, especially after our occupation of her industrial districts in the North and East. She was helped out by America's powerful support, without which France could hardly have supplied her own requirements, particularly as regards ammunition.

Russia could not at first draw full advantage from her enormous population; she had available an almost inexhaustible reserve of man-power, and managed to put her reserves into the front line at the right time and tolerably well trained. Against this, however, material armament was and remained quite inadequate. The Allied ambassadors were continually forwarding to their governments requests on the part of Russia for arms and ammunition; her own war industry never reached a stage of any considerable production.

Austria-Hungary was of all the great Powers certainly the worst organized for war—both as regards personnel and material. The different reasons for this state of affairs need not be considered; the

consequences showed themselves in the rapid decline of the striking power of her once splendid army and in the increasing economic demands made on Germany.

England was organized both for peace and war differently from all other continental powers. Although, in military circles at any rate, participation in a big war was considered, little preparation had been made to exploit fully the military resources of the nation. Evidently it had been expected that the Navy and the seven regular divisions, excellent and ready for immediate action, would have sufficed for the country's needs. For the equipment of this force the national industry, which was efficient enough, was adequate. It was Lord Kitchener's greatest merit that he recognised in good time that efforts of quite a different kind were necessary to produce a final victory, and that he initiated suitable measures. The results produced by English organization during the war are truly astonishing. As the new armies required time to take the field, the national industry had time to reorganize, and where it failed America came to the rescue.

The United States of America occupied a peculiar position as regards organization for war. Together with the navy the comparatively small peace army sufficed for current needs, and her geographical position allowed America to choose the precise moment for her entry into the World War. When once she had decided to come in, her organization developed an overwhelming activity, which enabled reserves of men and material to produce an army, whose resources were hardly broached at the end of the war.

Now to what military success did all this universal *levée en masse*, this titanic mobilization of armies lead? In spite of every effort the war did not end in the decisive annihilation of the enemy on the battlefield. Actually it petered out in the attrition of trench warfare, until the powers of resistance of one of the combatants, as regards personnel and material, and finally as regards *morale*, were beaten down, without really being conquered by the other's superior force. Was the victor truly elated by his success? Are the results of the war in just proportion to the sacrifices of national resources? When recourse must be made to arms, is it necessary every time for whole peoples to hurl themselves at each others throats? The soldier must ask himself whether these gigantic armies are still capable of being commanded in the sense of decisive strategy, and whether any future war between such masses must not again end in a stalemate.

Perhaps the principle of the nation in arms, the *levée en masse*, is to-day out of date, the *fureur du nombre* a thing of the past. The mass becomes immobile; it cannot manoeuvre, therefore it cannot conquer; it can only stifle.

Let us now glance at the conclusions which the leading powers have drawn from their own experience as regards the organization of their armies, naturally omitting those states whose armies have been restricted by the Peace Treaties. America and England have in essentials returned to their pre-war organizations, that is to say to the principle of small peace armies, ready for immediate action; only America has now considerably extended her arrangements for industrial mobilization and for the military training of her youth, while England has developed a strong air arm. France is engaged in reorganizing her army on new lines, the main features of which consist in the provision and maintenance of a peace army approximately at war strength, and consequently ready for action at short notice. At the same time France adopts a complete system of universal service in order to provide strong reserves. The period of colour service has been much reduced, so as to ensure that all men capable of bearing arms are trained without keeping the peace establishment at too high a level, while the value of the peace army ready for instant action is raised by the retention of a greater number of long-service volunteers. Industrial mobilization and the early training of youth are carefully worked out, as is also the utilization of black troops. The powerful French air force immediately ready for action is especially worthy of notice. Italy seems to count on supporting her professional army by the employment of Fascist militia and in exploiting actively the military-fascist training of her youth.

Russia, still hampered by many difficulties, but making decided progress, is trying to provide herself with a peace army ready for use and proportionate to her need for security, and at the same time is endeavouring to gain military control of her enormous man-power by a militia system. In the newly organized armies of Poland, Czechoslovakia and Yugo-Slavia we find, throughout, the pre-war system of universal service, with the period of active service reduced as low as possible while the necessary peace armies are maintained in a state of the greatest possible readiness.

Thus it would appear that the practical utilization of war experience has resulted in no great departure from the principles of pre-war days; although new tendencies are becoming very distinct. The general economic situation compels all states to reduce their expenditure in armaments, and, in particular, to reduce the costliest form of armament—namely strong and fully equipped long-service standing armies—and at the same time to limit, as far as possible, the unproductive exploitation of the nation's man-power by military service.

The present political situation is such, however, that there is need for a feeling of security against sudden hostile attack. This feeling of

security can only be obtained by the maintenance of a standing army immediately ready for action, and by the desire on the part of each state to be prepared for a war of life and death by organizing its national resistance to the fullest extent. Preparations for a national war are really defensive measures, the scope of which depends on the extent to which one state is threatened or feels itself threatened by its neighbour. This feeling of insecurity cannot be given an arithmetical value in computing the possible extent of disarmament. The only factors which are comprehensible, and which can be included in striking the balance, are the total figures of available resources; the greater guarantee of peace lies in adjusting the balance of power rather than in seeking an idealistic and unattainable reduction of power. Thus can we shortly dismiss the problem of disarmament.

The basis of modern war is the struggle between man and material. The shield was invented to meet the sword, the concrete emplacement to meet the high explosive shell, the respirator to meet gas. This struggle will continue so long as war exists, and from time to time the offensive weapon will gain the upper hand until the defence has over-reached it. Science works for both sides. It is therefore quite misleading to talk of the triumph of the machine over man. The machine has only defeated mass humanity and not man himself, and never will, for it can only come to life in the hand of man.

The mistake lay in opposing an immobile almost defenceless, mass of humanity to ruthless machinery. The more we increase the masses of our fighting men the more certain becomes the triumph of the machine; for its limits exceed those of the supplies of man-power. The matter therefore resolves itself into a war between the human brain and inorganic matter. As science advances and as more inventions and resources are placed at the disposal of the army, the demands made on the soldiers, who utilize the new weapons, will increase. Anyone who has even a slight idea of the technical knowledge, the highly specialized training, the complicated instruments, and the well drilled *morale* required in order to control effectively the fire of modern artillery, must admit that these conditions cannot be attained with hastily trained troops, and that such troops are only cannon-fodder, in the worst sense of the word, when opposed to a small number of highly trained specialists. But what happens when these troops do not exist and when no living target is presented to the machine controlled by science? Destruction of the enemy's army, not destruction of his country, is still the first law of strategy, although sometimes it may appear in a different guise. The machine wins its victory over the living and mortal mass, not over the living and immortal human brain.

Whoever speaks of modern military science, will first of all think of the air arm. Partly in the World War, but really only after it, this new arm took its place in full partnership with the land and sea services. Yet there has been no alteration in the principles of war. The soldier and his allied technician merely have to contend with one additional battlefield with its particular conditions. The possibility of air attack on the vital points of national powers of resistance, that is to say on the centres of military strength, has led to false conclusions being drawn as to the necessity of land forces. These centres were always objects of attack; the ease with which they can be reached alone is new.

The only difference is this: whereas hitherto fighting has been confined to land and sea, decisions will now be sought in the air. People are often apt to think that in future the fighting will be carried on above the heads of the soldiers and will be directed exclusively against the civilian in office and workshop. War against the back areas and against the civilian is no new thing in history, while it would be foolish to deny or to make light of the dangers and horrors of air attack on back areas, especially in combination with the use of gas. It brings the same dangers and the same objects into a new theatre of war; active defence against this form of attack is the task of the air arm, which, as the best counter-measure, seeks to carry the attack into the enemy's country, or at least to destroy the attacker. This new danger has given rise to a new demand, the provision of some form of passive defence for the vital centres of a country, though this method is no doubt costly and cumbrous. It is difficult to understand and still harder to justify the fact that we in Germany, to whom active air defence is denied, are doing absolutely nothing in the way of this passive defence.

Now let us imagine what course a future war will take.

Hostilities will open with attack and counter-attack on the part of the opposing air fleets, since they form the forces which are readiest for action and swiftest to strike the enemy. The objective will first of all not be capital towns and sources of power, but the opposing air force, and only after its conquest will other objectives be attacked. When conditions are more or less equal, a decision will not be reached very rapidly, even when one side is forced to remain on the defensive. The nature and magnitude of the successes of the superior attacker, both material and moral, depend on the powers of passive and moral resistance of the defender. It must be remarked in this connection that all large troop concentrations form easy and good targets. One of the main tasks of the air attack will be to disturb the mobilization of the enemy's man-power and industry.

The attack initiated by the air force will be taken over as rapidly as possible by the troops most ready for action, i.e., essentially the peace-time army. The greater the efficiency of this army, the greater

its mobility, the more determined and able its commanders, the greater will be the prospect of it rapidly putting the opposing hostile force out of action and of preventing the enemy from organizing and sending into action further forces, and perhaps even of compelling him to seek peace. Whilst the two regular armies are engaged in the struggle for this first decision, in their rear will commence the organization of the defensive power of the country. The victor in the first phase of war will attempt by means of his superior armament, training and mobility to prevent the masses—superior in number, inferior in quality—of the enemy from developing their power and particularly from organizing fronts bristling with material, whilst on the other hand he will draw from his own reserves of men and material the support required to maintain his own striking power. I therefore see, to resume briefly, the future of the conduct of war in the employment of highly efficient and highly mobile armies, i.e., smaller armies, whose effect is considerably increased by the air arm, and at the same time in holding ready the whole of the manpower of the country either for adding weight to the attack or for defending their country to the last.

The need for these modern armies cannot be gainsaid. Their task has been briefly sketched above. It is interesting to speculate as to what they will look like.

The peace-time army, which may also be designated a covering or operating army, will consist of professional soldiers, if possible of volunteers, serving for a long period. The length of colour service will vary and will depend upon the purpose for which the individual soldier is to be employed, since it naturally follows that highly technical training will necessitate a longer period of colour service, whilst in other units young men sound in mind and body are required. The strength of this army will be in proportion to the financial resources of the country, its military and geographical situation and its size; it must at least provide it with security against surprise hostile attack.

It will be objected that this circumstance will provoke competition in armaments; but, apart from the fact that the strength of a very costly peace-time army is limited by the financial resources of the country, the strength of peace-time armies offers the best object for international conventions, and consequently for the limitations or adjustment of armaments. It goes without saying that each country will raise this army to the very highest pitch of perfection both as regards the training of commanders and men and its armament and equipment. In this connection there are three main requirements, that is, great mobility, to be attained by the employment of numerous and efficient cavalry,

and by the utilization to the utmost of mechanized trains and of the marching capacity of the infantry, by the best possible armament, and by constant replacement of men and material.

For its first entry into action, this army of manœuvre requires, at best, no additional personnel, or at any rate, only a small increase; therefore no mobilization.

In addition to, and in close touch with, this army is a permanent training staff, composed of officers, non-commissioned officers and men, through whose training units and schools pass the whole youth of the nation that is capable of bearing arms, with an initial short period of service followed by the necessary refresher courses. This will result in the creation of a force which, although unfit for employment in open warfare and offensive decisive battles, is yet in a position, after completion of its training, such as it is, and adequately armed, to undertake the task of defending the country; and at the same time, by supplying drafts drawn from its best elements, to maintain the fighting field army proper at full strength. In order to make this short period of training endurable it must be carried out with the youth of the nation, but weight must not be laid so much on the military side as on physical and mental training. It can only be made effective, however, if imposed by the State. It would take us too far afield to go into the details of this organization, such as the obtaining and training of future officers; but a few words may well be devoted to the question of armaments, which is closely bound up with that of the indispensable economic preparation for war.

In discussing this question we must proceed from the principle that an army never, or at least only temporarily, possesses the weapon it would like to have, or that which is the best possible weapon at any particular moment; for as soon as a weapon is introduced it becomes obsolete owing to the rapid progress of science. The expense of the conversion of the armament and of the re-arming of a large army is so enormous that no country will undertake such measures until actually compelled to do so.

The smaller an army the easier will it be to arm it on up-to-date lines; it is impossible to keep in stock sufficient supplies of modern armament for armies which number millions.

The necessity for having the field army constantly ready for immediate action and armed with the best possible weapons makes it necessary to have armament available in sufficient quantities and of the very best quality. It is also necessary to maintain reserve stocks and to organize sources from which these stocks can be replenished. The cost of this demand has the effect of restricting the strength of such a peace-time army. But the strength having once been decided upon, not only must

the armament and equipment deemed necessary be in the hands of the army, but also the stocks required for initial replacement must be available to meet requirements until the factories which exist for this particular purpose start producing fresh supplies. This demand is in itself obvious, and would present no novel feature if we were only dealing with the *levée en masse* of the nation. Actually, the main consideration is the smaller field army, and this places the arming of the nation on an entirely new basis. It is impossible to hold stocks of armament and equipment ready for a modern army of millions if the justifiable demand is put forward that these masses, in view of their inferior military training, require special support from the material issued to them. The accumulation of large reserve stocks is the most uneconomical state of affairs which can be imagined. Further, in consequence of the fact that they naturally soon become obsolete, such accumulations would be of doubtful military value. Think, for instance, of stocking thousands of flying machines, which are frequently rendered worthless after the lapse of a year in consequence of the production of new types.

For the arming of the masses there is only one way ; to decide upon the type of the weapon, and then to prepare for mass production when the need arises. The army, allied with science, is in a position, by constant study in experimental establishments and on the training grounds, to decide what is the best type of weapon for the time being. Arrangements should then be made with industry under which the production of this type could be taken in hand at once and in the requisite numbers. This necessitates thorough preparation for which legislation is indispensable. These preparations should be made in close co-operation between soldiers and economists, who, after deciding what raw materials are required and after making provision for them to be available, would deal with the selection and installation of the factories for all parts of the armament and equipment. To prepare the conversion of factories from a peace to a war footing and the holding ready of material and plant naturally requires government subsidy in peace time. This, however, will be more advantageous to the State than the acquisition and maintenance of large obsolescent stocks of arms. If the military requirements are framed with a view to rapid mass production by renouncing the finest in favour of the simplest possible material, then the time elapsing between the placing of orders and the commencement of deliveries can be reduced to a minimum. This gaining of time is the task of the manœuvre army in the field.

AIRSHIPS AND AEROPLANES: A COMPARISON¹

Being extracts from a lecture delivered to the Aeronautic Division of the American Society of Mechanical Engineers, by Mr. Carl B. Fritzsche, Vice-President, Aircraft Development Corporation, June, 1928.

RECENT transatlantic flights by aeroplane have encouraged so many extravagant claims for heavier-than-air craft that they challenge critical examination. Little heed is given to certain inherent limitations which apparently confine the aeroplane to short-range commercial application and discourage its use in long distance trans-oceanic service. On the other hand, the recent lack of transatlantic flights via airship has made man forgetful of past achievements of lighter-than-air craft.² Current publications would startle the public if it were announced that Lindbergh was the sixty-ninth man to make a non-stop flight across the Atlantic. Yet the statement is true historically.³ Great Britain led the way in 1919 with the dirigible airship, "R.34," on the remarkable round-trip flight from London to New York, and Germany followed in 1924 with the Zeppelin, "ZR.3," now the U.S.S. "Los Angeles." The British airship covered a non-stop distance of 3,200 statute miles each way. The German airship, after travelling 5,066 miles from Friedrichshafen to Lakehurst, New Jersey, had enough reserve fuel to continue on to Denver, Colorado, or a possible combined mileage equivalent to a non-stop flight from San Francisco to Australia.

The comparative examination herein proposed is necessarily limited to the determination of which of these two distinctly different types of aircraft is inherently applicable to long-distance trans-oceanic service. Both types have made non-stop flights across the Atlantic. Therefore the discussion will be confined to the Atlantic, but will be broad enough to cover any hypothetical commercial route from North America to Europe. Obviously, any conclusions reached will, with little modification, be applicable to longer routes over other oceans.

VOLUME versus AREA.

The general question confronting both the aeroplane and the airship is, "Can you fly the Atlantic commercially?" The answer is, "No!

¹ We are indebted to the Editor of "The Aeroplane" for a copy of this lecture.

² This paper was prepared prior to the flight of the "Graf Zeppelin" from Friedrichshafen, Germany, to Lakehurst, N.J., and return, in October, 1928.

³ The 100th if the return journey of "R.34" be taken into account.

Not with my present small 'pay cargo' capacity." The next question is, "Then what improvement in performance may we expect of you as your size increases?"

Before engaging in a detailed examination of each type, it is clarifying to recall certain elementary facts: first, that the airship is sustained by static forces and the aeroplane by dynamic forces. Second, that the gross lift of the airship is determined by its volume, independent of its power plant, while the gross lift of the aeroplane is determined by its wing area and its power plant.

For example, in lighter-than-air craft the gross lift varies as the cube of the mean dimension, while the air resistance and the horse-power required vary as the square of the linear dimensions. In a heavier-than-air craft the gross lift is controlled by its aerofoil surface and its speed. It is evident that an increase in lift can be obtained more easily without a proportionate increase in weight by augmenting volume rather than by increasing area.

The result is that the useful or disposable load per horse-power of the airship increases very rapidly with volume, while in the aeroplane the useful load per horse-power is practically a constant, shows little increase with size, and actually decreases in extremely large sizes.

The testimony of scientists and engineers whose researches in aerodynamics and motor mechanics have been most profound, and whose dicta are recognized throughout the world as beyond question, shows conclusively that there are inherent limitations in the performance of heavier-than-air craft.

A number of distinguished experts agree that "a plane weighing between 40,000 and 50,000 lbs., with materials now known, marks a limit beyond which the increase of size would not be profitable. This seeming paradox results from the fact that the ratio of disposable weight to gross weight grows less owing to limit of wing-girder strength, heavier engines, heavier weights of material required for strength, multiple landing gear, etc."; also that "the present maximum performance of heavier-than-air craft may be increased about 30 per cent. by future development extending over an indefinite period of years." Further, that "increase of performance may be obtained by engine development, adaptation of lighter materials to construction, some possible improvements in aerodynamical characteristics, such as wing surfaces, stream lines, balance, control, etc., but an increase beyond the 30 per cent. cannot be foreseen as being attainable with materials so far known." Based on the testimony of these experts, it is apparent that, contrary to popular opinion, the aeroplane does not increase in efficiency with size.

THE 50,000-LB. AEROPLANE.

For example, let us assume the most favourable performance possible, in the light of present-day knowledge, of the 50,000-lb. aeroplane beyond which, Captain Richardson, U.S.N., testifies, the efficiency of heavier-than-air craft decreases.

Most commercial aeroplanes now used have a power-load factor of 18 to 20 lb. per h.p., therefore let us assume a power load of 20 lb. per h.p. By dividing 50,000 lb. by 20, we obtain an available rating of 2,500 h.p., which is herein adopted for the purpose of discussion.

For fuel consumption, let us assume 0.5 lb. per brake horse power-hour, including lubricating oil, which represents maximum efficiency with present standard engines. Let us assume that the disposable load, exclusive of crew, radio instruments, etc., is 50 per cent. of the gross lift, or 25,000 lb. This is recognised as a high figure for a plane of this size, and in actual practice it probably would not exceed 45 per cent. Nevertheless it is adopted in order to present the most favourable picture that can be projected at the present moment.

At a cruising speed of 100 miles per hour, which is high, and assuming conservatively, at the specified cruising speed, an average consumption of 70 per cent. of 0.5 lb. per rated horse power-hour, the 25,000 lb. of disposable load utilized entirely for fuel would give a maximum endurance range of 2,375 miles, with no space left for pay load whatsoever. It will be observed that this range, which includes an allowance of 25 per cent. fuel reserve for head winds, is short of the distance which aircraft must negotiate from New York to the British Isles, to say nothing of Europe.

Take, for example, the longest leg, 2,000 miles, on the proposed route from New York to Europe via Bermuda and the Azores. Using the same performance above recited and allowing 25 per cent. reserve fuel for head winds, this theoretical 50,000-lb. aeroplane would be able to carry, in addition to its fuel, only one and one-half tons of pay load from Bermuda to the Azores, or about 6 per cent. of its gross weight, which, on its face, is not commercial.

However, it will be contended, and may be admitted, that future improvement of fuel, as well as the thermal efficiency of internal combustion engines, will lower the weight of fuel consumed per horse-power hour. As engineering knowledge that applies to aircraft engines accumulates, great economies may be expected. In fact, one engineer of the author's acquaintance has advised him that in the laboratory a more efficient fuel has been experimented with which indicated a consumption of .33 lb. per b.h.p.-hour for internal combustion engines.

Applying this latter figure to the 50,000-lb. aeroplane, we obtain a total maximum range of 3,460 miles, which is just sufficient, with a 25

per cent. fuel reserve for head winds, to enable the plane to fly non-stop from New York to France, but leaves no carrying capacity for pay cargo. Although this theoretical plane is four times the size of the largest plane that so far has crossed the Atlantic, the practical result is the same as that already experienced, i.e., pay load equals zero!

Commercially, it would be just as practicable as to attempt a non-stop motor-bus tour from New York to San Francisco, filling the interior of the bus with gasoline tanks instead of passengers. As a stunt it would be interesting, but commercially it would be a failure.

In neither of the two examples above recited is an equal amount of reserve engine power continuously available as is considered common sense practice in older forms of transportation. In each instance the full rated horse-power of the aeroplane is utilised during the initial stage, when it is carrying its maximum fuel load.

In contrast, the "Leviathan," the largest ship in the world, uses 65,000 h.p. at normal cruising speed. There is available 90,000 h.p. The 20th Century Limited, crack train of the New York Central, uses 1,500 h.p. on its normal high-speed run. There is available 4,000 h.p. The 1928 Wasp-engined Fokker transport, purchased by Western Air Express for the Daniel Guggenheim Safety Passenger Line from Los Angeles to San Francisco, uses 600 h.p. in normal cruising. There is available 1,200 h.p.

AEROPLANE *versus* FLYING BOAT.

Even if it were physically and economically practicable, the majority of authorities argue against using aeroplanes at all on long distance flights over water. They point to the fact that it is specified in established government airways over land that at convenient intervals—every 25 or 50 miles—there should be made available emergency landing fields so that in the event of engine failure or adverse weather a safe landing can be made. Obviously it is impracticable to establish these emergency landing fields across the Atlantic, hence the reason why common sense dictates more favourable consideration of the flying boat rather than the aeroplane for long distance flying over water. It is also recognized that any aircraft so employed must be staunch enough to battle high waves in the event of engine failure or any other cause that compels a forced landing. For in transportation circles it is axiomatic that any craft must be able to sustain itself in the medium in which it floats.

Therefore let us examine the flying boat. A few weeks ago, Dr. Claude Dornier, the celebrated builder of flying boats in Germany, delivered an address before the Royal Aeronautical Society in England, in which he gave attention to five different sizes of flying boats, ranging in gross

weight from 1,473 lb. to 113,300 lb. The first four boats have been built and flown, and the fifth and largest is now under construction at Friedrichshafen. It is designed to have accommodation for 100 passengers and a range of 1,000 kilometres or 621 miles. Table I gives a sufficient number of the characteristics of these several boats to furnish a basis for comparison.

TABLE I.
CHARACTERISTICS OF SEVERAL TYPES OF FLYING BOATS.

	Gross weight.	Useful load minus crew.	Total.	Useful load lb.	Top speed.	Cruising speed.	Range. miles.	Wing loading lb. per sq. ft.
	lb.	lb.	h.p.	per h.p.	m.p.h.	m.p.h.	miles.	
Type A	1,473	175	80	2.19	85	68	365	8.78
" B	6,280	2,105	450	4.68	101	87	1,000	11.00
" C	13,270	5,282	900	5.87	119	99	1,415	12.95
" D	31,000	14,096	2,000	7.05	137	105	1,810	20.00
" E	113,300	56,815	6,000	9.47	149	115	2,635	22.50

These figures indicate that Captain Richardson's curves, showing 50,000 lb. gross weight to be the most efficient size of the aeroplane, do not apply specifically to flying boats. Possibly this is due in part to the absence of the enormous parasite drag from the multiple landing gear with wheels about six feet in diameter which would be required on an aeroplane equal in size to the Dornier "50-Ton" flying boat. Furthermore, a higher landing speed can be tolerated in flying boats than in aeroplanes because boats in manœuvring are not restricted to the narrow confines of landing fields; they can utilize more distance, and the impact at landing on water is more evenly distributed throughout the structure than is true of the aeroplane on land.

EFFECT OF INCREASED SIZE.

He points out that with increase in size, the weight of the complete hull drops from 1.85 lb. per c. ft. for the small boat A to 1.168 lb. per c. ft. for the very large boat E.

For the wings, similar but opposite figures are given. The specific weight of structure rises from 1.43 lb. per sq. ft. for type A, to 3.27 lb. per sq. ft. for type E. But the permissible wing loading increases simultaneously, and to the advantage of the larger boat. For in type A boat the gross lift per pound of wing structure is 6 lb., while in type E it increases to approximately 7 lb. More efficient frame members and a decrease in weight of skin per gross lift probably account for this improvement.

Dr. Dornier further points out that the weight of fuel tanks decreases with the size of the boat. From 0.7 lb. per gallon for type A the weight

decreases to 0.36 lb. per gallon for type E, as the tank capacity increases from 15 gallons to 4,200 gallons. There is also a similar drop in the weight of oil tanks.

In passing from type B to E, the wing area increases nine times and the disposable load sixty times. The useful load per horse power—4.68 lb. for type B—increases to 9.47 lb. for type E.

FUELLING STATIONS NECESSARY.

However, the largest of these flying boats, which for convenience we shall call a "50-Ton boat," is given a maximum range of only 2,635 miles by its designer. It is more than three times larger than any flying boat ever built. In efficiency it appears to approach the maximum so far as size is concerned. Yet its range will not permit non-stop trans-Atlantic service. Therefore its commercial application demands that it refuels en route. Let us see which region of the Atlantic offers the most inviting prospect, and ascertain what pay load may be transported on a commercial route from New York to London.

THE NORTH ATLANTIC ROUTE.

Some of those who recognize the deficiency of heavier-than-air craft over long distance flights recommend that the Atlantic crossing be made by a number of short hops via Newfoundland, Labrador, Greenland and Iceland to Europe. It sounds fascinating, but who relishes the thought of a forced landing in the North Atlantic in mid-winter? Should not attention be directed to the fact that heavy fogs prevail in that region during 90 per cent. of the year, and that the hazards of ice forming on the wings and fuselage are extremely serious? Remember, the weather cannot be changed, and that it is permanently bad in this particular region for the simple reason that North East of Newfoundland the cold Arctic Current comes down and repels the warm Gulf Stream, thus producing a thermal contrast and an unbalanced condition in pressures that creates a constantly existing storm hazard for any kind of transportation, whether it be via ocean liner or via air.

Reference is made to the experience of the round-the-world fliers of the U.S. Army in 1924, who returned from Europe via Iceland, Greenland and Labrador, from which one obtains a most vivid account of the extremely hazardous and almost prohibitive dangers which prevail in that area with respect to meteorological conditions and particularly with respect to the hazards of fog and ice. It can be accomplished, yes, with supremely excellent navigation and mechanical perfection, but one thing is certain; the weather is not susceptible to control by mankind. Neither can the forces of nature be ignored. The flying of passengers over the Atlantic cannot become practicable unless conditions obtain which

will assure the safety and comfort which the average public demands. And the lack of safety and comfort in the North Atlantic has been a matter of common knowledge for centuries.

THE SOUTHERN ROUTE.

Let us give consideration to the proposed route via the Azores, where meteorological conditions are more favourable. The maximum flight on this route would be about 2,000 miles—from Bermuda to the Azores. The other distances to be covered would be 700 miles from New York to Bermuda and 1,700 miles from the Azores to Southampton, where the transfer to London probably would be made by train. Using Dr. Dornier's most optimistic estimate for a 50-ton flying boat, we obtain this estimate of elapsed time en route and weight of maximum pay load:

LEG.						Time required.
						hours.
New York to Bermuda	..	..	..	..	700	6.1
Bermuda to Azores	..	..	..	..	2,000	17.4
Azores to Southampton	..	..	..	..	1,700	14.8
Total flying time in still air						38.3
Add—						
(a) For service, refuelling, and rest period, $1\frac{1}{2}$ hr. each at Bermuda and Azores.. .. .	..	..	..	..	..	3.0
(b) For transfer from Southampton to London, 75 miles via train .. .. .	..	..	..	..	..	1.7
Total elapsed time with no allowance for head winds..						43.0

Referring to Table 1, we find that the Dornier 100-passenger boat E, now under construction, has a gross weight (loaded) of 113,300 lb., or slightly in excess of 56 tons. However, to be liberal in our estimate of its performance and to allow for future structural improvements, let us assume the gross weight at 50 tons and accept Dornier's estimate (Table 1) of 56,815 lb. available for useful load in addition to crew. The power load factor will justify this. The question is, what proportion of this useful load will be needed to effect the 2,000-mile flight from Bermuda to the Azores?

FUEL LOAD AND PAY CARGO.

Table 1 gives the top speed at 149 m.p.h., the cruising speed at 115 m.p.h., and the available power at 6,000 h.p.

The specific hourly fuel consumption is $6,000 \times 0.5$ lb. per h.p. hour = 3,000 lb. Let us assume the average hourly fuel consumption (at 115 m.p.h. cruising) at 70 per cent. of 3,000 lb. or 2,100 lb.

The maximum leg is 2,000 miles, and thus requires 17.4 hours at 115 m.p.h. cruising speed.

Then— $17.4 \times 2,100$ lb.	36,540 lb.
Add 25 per cent. fuel reserve for head winds	9,135 lb.
Total fuel required	45,675 lb.
Add for radio and commercial equipment	1,140 lb.
Total	46,815 lb.

Subtracting this weight from the estimated useful load (56,815 lb.) we have 10,000 lb., or 5 tons available for pay load. This represents 10 per cent. of the gross lift, or 1½ lb. per rated h.p.

This performance does not compare favourably with commercial aeroplanes on air-mail routes, refuelling at maximum intervals of 500 miles and transporting a pay load equivalent to 25 per cent. of the gross lift, or about 5 lb. per rated h.p.

In flying the entire route of 4,400 miles across the Atlantic, this 50-ton boat would consume (with no allowance for head winds) about 41 tons of fuel. At \$80 per ton, including lubricating oil, this would represent an operating charge for fuel alone of \$3,280, or 15 cents per ton-mile. Assuming that other operating charges would be proportionately as high, this would thus tend to substantiate the claim of operators of aeroplanes overland that intermediate stops of 400 to 500 miles for refuelling are imperative. Otherwise the operating cost takes a rapid upward turn that soon becomes prohibitive because of the attendant reduction in pay-cargo capacity.

AIRSHIP PROGRESS RETARDED.

It is significant to relate that of the 133 rigid airships built in Germany by Zeppelin and Schutte prior to the Versailles Treaty and operated by German personnel, not one ever failed structurally during a flight. So proficient as naval scouts did these airships become in patrolling the North Sea, that eminent naval authorities attribute to the Zeppelin the fact that the German Fleet was able to escape at the battle of Jutland.¹

Then came the Treaty of Versailles which, until recently, prohibited the Germans, the pioneers in rigid-airship construction, from applying to the commercial field the excellent experience in construction and operation gained during the war.

In England, during and since the world war, fourteen rigid airships have been built, and only one, the "R.38" failed structurally in flight (in 1921).

In the United States, the richest nation in the world, only one rigid airship has been built to date, the U.S.S. "Shenadoah," which was destroyed in a violent storm in Southern Ohio in 1925.

¹ This is not correct.—EDITOR.

It is indeed tragic that these two disasters with the attendant loss of valuable lives should have occurred, but engineering science is not so perfect that there can be complete assurance against such mishaps in the development of new applications. Structural failures in ocean vessels have occurred, and do occur occasionally even to-day. Failures in great bridges are not unknown. However, as the experience of the engineer advances, failures become steadily less likely. The lessons learned from the "R.38" and the "Shenandoah" are not without value in avoiding a repetition of such catastrophes.

The total of 149 units represents the world's effort in rigid airship construction (prior to the flight of the "Graf Zeppelin.")

Many people appear to be impatient with the progress of rigid-airship development. They should be reminded that the art of design and construction of lighter-than-air craft has not yet come to its maturity. In airship development, and aeroplane, too, for that matter, it is impossible by the very nature of the product itself to conceal from public view even the most insignificant experiment, and if it is not at once a success, the failure often receives more public attention than does the success which may follow immediately after.

AIRSHIPS' SUPERIOR COMMERCIAL PERFORMANCE.

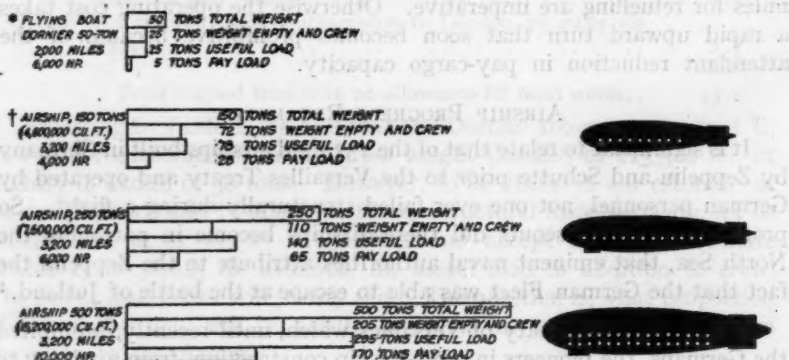


Fig. 1.—FLYING BOAT versus AIRSHIP—New York to London.

* New York to London via Bermuda, Azores and Southampton. Distance, 4,400 miles. Cruising speed, 115 m.p.h. Performance based on longest leg, i.e., 2,000 miles from Bermuda to Azores. Fuel supply allows 25 per cent. margin for head winds. Time required, 43 hours (still air), including two stops for refuelling and transfer from Southampton to London.

† All airships are assumed inflated with helium (lift 65.6 lb. per 1,000 cu. ft.). Cruising speed, 75 m.p.h. Distance, 3,200 miles. Fuel supply allows for 50 per cent. margin for head winds en route from New York to London. Time required, 43 hours (still air) non-stop.

During the past year the concentration of public attention on trans-oceanic flying has so tended to mask the inherent short range characteristics of the aeroplane that the far superior qualifications of the rigid airship for long distance, heavy cargo transport have been lost sight of almost entirely.

For purposes of comparison the Dornier 50-ton flying boat, previously described, is selected to represent heavier-than-air. Its vital characteristics on a 2,000-mile range are illustrated in Fig. 1. They are based on a Bermuda to Azores flight, which is the longest leg on the hypothetical New York—London route. The maximum possible pay load is only 5 tons, or 10 per cent. of its gross lift.

Contrast this performance with the helium-inflated 150-ton rigid airship, Fig. 1, which, on a 3,200 mile non-stop flight from New York to London can transport a pay load of 28 tons or about 19 per cent. of its gross lift. The next size, a 250-ton ship, shows a performance over the same route of a 65-ton pay load, or 26 per cent. of its gross lift. And the last ship illustrated carries a pay load of 170 tons, or 34 per cent. of its gross lift. Each of these three airships has sufficient power at 75 m.p.h. cruising speed to cover the 3,200 miles from New York to London in forty-three hours, or identically the same time (in still air) as the flying boat requires on the Bermuda-Azores route. In the useful load of each airship is included a 50 per cent. fuel reserve for head winds, while in the flying boat only a 25 per cent. fuel reserve is provided.

The two airships now being built in England are about equivalent to the first size illustrated, and the larger, 250-ton ship follows in natural sequence. It may be explained that the performance of the airship is based on the assumption that the ship is fully inflated with helium lifting 65.6 lb. per 1,000 cu. ft.

This corresponds to the lift of 94 per cent. pure gas in air of 60 per cent. humidity at 29.95 in. barometric pressure and at a temperature of 32 deg. fahr. The assumption of a 100 per cent. inflation of the ship is made merely to simplify the computation. In reality, of course, the ship cannot be inflated 100 per cent. on account of the expansion of the gas which accompanies ascension. However, by the partial use of gaseous fuel (natural or Blau gas), which does not add weight but even contributes a little lift, the same effective lift can be obtained.

USEFUL LOAD PER HORSE-POWER.

The comparative performance of aircraft can be expressed almost entirely in pounds of useful load per horse-power. The marked superiority of the airship obviously increases with size. Eleven pounds per horse-power appears to be the maximum useful load for the flying boat, while at 74 lb. of useful load per horse-power for the airship the curve still continues upward.

Table 2 demonstrates a startling difference in the performance of lighter-than-air craft over heavier-than-air craft when applied to trans-oceanic service. Here we have two aircraft of the same horse-power, yet one transports thirteen times more pay cargo than the other.

TABLE 2.
6,000-H.P. AIRSHIP *versus* 6,000-H.P. FLYING BOAT, NEW YORK TO LONDON.

	Airship (A.)	Flying Boat (F.B.)	Approx. ratio. A./F.B.
<i>Units of Comparison—</i>			
Tons gross weight	250	50	5.0
Tons useful load	140	25	5.6
Tons pay load	65	5	13.0
Horse power	6,000	6,000	—
Fuel reserve, per cent.	50	25	2.0
Pounds useful load per h.p.	47	9.47	5.0
Pounds pay load per h.p.	21.67	1.67	13.0
Construction cost : ¹ Airship at \$15,000 and boat at \$7,500 per gross ton	\$3,750,000	\$375,000	10.0
<i>Route Comparison—</i>			
Distance miles	3,200	4,400	3/4
Time required (still air), hours	43	43	—
Landings including intermediate stops	1	3	1/3
<i>Collective Comparison (for same pay load)—</i>			
Number of units employed	1	13	1/13
Total gross weight, tons	250	650	5/13
Total pay load, tons	65	5	—
Total horse-power	6,000	78,000	1/13
Total construction cost	\$3,750,000	\$4,875,000	3/4
Total fuel required, tons	75	533	1/7
Total cost of fuel at \$80 per ton	\$6,000	\$43,640	1/7

¹ Construction cost based on production and not on experimental units, which would run considerably higher.

Suppose we allow for a future 30 per cent. improvement in heavier-than-air craft (as suggested in the Navy Board Report previously referred to), still the flying boat's effectiveness in long-distance service would be only 10 per cent. of the performance of a 250-ton airship, and most certainly airships will improve, too, and also increase in size, which again adds to their efficiency.

AIRSHIP THE SAFER.

Not only is the airship superior in tons of pay cargo carried, but it is superior in comfort when passengers are transported. Its control and navigation are deliberate and certain. Meteorological reports received by radio at regular intervals enable it to vary its course to take advantage of favourable winds. Having a cruising speed twice that of the rate of

travel of the average storm area, it can avoid violent weather almost entirely. Arriving at its destination and finding unfavourable fog conditions, instead of being compelled to land because of depleted fuel supply, it can hover with engines idling until conditions improve.

Perhaps it is still more illuminating to compare the airship with two of the older and better known forms of transportation. The advantage a 200-passenger airship enjoys over the train and steamship in terms of gross weight of vehicle required per passenger transported is instructive. In the airship it is 2,500 lb. per passenger; in the 20th Century Limited, 9,000 lb.; and in the "Leviathan," 26,000 lb. The economy in material, capital investment, maintenance and replacement is amazing.

CONCLUSIONS.

This comparative examination inevitably leads to three conclusions:

- (1) In commercial application, the aeroplane, large or small, has comparatively a short range. Physically, it is unsuited to overseas service. Its use in transoceanic flying is unsafe and should be discouraged.
- (2) Provided intermediate stops at suitable intervals are available for refuelling, the large flying boat has possibilities in overseas service. However, no matter how large it may be built, it can never compete successfully with the rigid airship in economy, comfort and safety.
- (3) The large rigid airship will always be supreme in long distance heavy-cargo transport. It is the most neglected yet the most promising mode of transportation overseas extant.

THE ELIMINATION OF INFANTRY

BY MAJOR G. W. REDWAY.

WHEN the Great War started every British division mobilized with 10,896 bayonets in forty-eight companies. To-day the Army is visualizing a division in which only 2,862 "bayonets" will be mobilized.

The process of elimination of bayonet power has advanced invisibly under cover of that blessed word Reorganization. It began with the maintenance of eight Lewis guns by infantry, which deprived each company of 50 per cent. of its riflemen or bayonets. Other reductions—as for instance, 50 per cent. of the sergeants—brought the total strength of a British company down from 227 to 159. A further diminution of bayonets in a division is now being effected by the disbandment or conversion of 25 per cent. of its "rifle" companies. No military reason has been given for this procedure. The Secretary of State for War, in announcing his decision to "reorganize" battalions of Foot Guards and Infantry of the Line, at home and in the colonies, merely stated that the present machine gun platoon was to develop into a company and that four anti-tank guns were to be added to the battalion. But to-day, it is almost common form to preface any sweeping change with some such dictum as "the additional mobility and carrying power of mechanical vehicles, along with the striking force of tanks, are creating a revolution, not in the principles of war, but in the application of those principles." And these soothing words appear to carry conviction to many minds that nothing unusual is taking place. But what are the cold facts? Mechanical vehicles, as substitutes for horse traction or railroads, may be an improved method of land transport, but their functions there end. Allowing that on a battlefield tractors may prove to be more useful than animals in dragging guns, ammunition wagons and ambulances, what is their relation to foot soldiers? The "striking force of tanks" again is an expression that needs clarifying. Are we to regard the tank as a battering ram or as a movable fort? In either case its efficacy depends—among other things—upon the absence of hostile artillery of sufficient power to smash the fort and of engineers who will oppose the ram with some form of boom defence or other pitfall. But the

proper study of infantry is the enemy foot soldiers within view ; from distant foes they look for protection to the mounted arms after command of the air has been secured. Intrusive tanks who have escaped our shells and obstructions must evidently be engaged by other tanks of similar weight or superior agility. The foot soldier's business is to drive from the field whatever infantry the enemy has brought into action and to dominate the newly acquired territory.

Taking the company as the fighting unit, comparison may be made between Soviet and British infantry. The Soviet company has a ration strength of 239, the British has only 159 all ranks ; it also has 9 rifle sections or 81 bayonets ; its armament also includes 9 automatic rifles and 14 machine guns. The British company—its opposite number—yields only 48 bayonets and 8 Lewis guns. A comparison of battalions shows 18 British machine guns and 24 Lewis guns opposed by 42 machine guns and 27 automatic rifles ; the Soviet battalion also counters our 144 with 243 bayonet men ; yet the Soviet War Office will hardly be accused of blind adherence to obsolete tactics.

The debate in the House of Commons on 8th March, 1928, produced many an argument as to the uses of cavalry and tanks, but nobody challenged the reduction of infantry ; there was no comment on the fact that a British three-company battalion, when the Lewis gun crews and machine gun crews are deducted, will produce only a gross of bayonets, and that the infantry division in consequence will dispose of only 1,728 riflemen or bayonets, minus any casualties since the day of mobilization. Deficiencies in the bayonet strength of a battalion, it will be said, are amply compensated for by an increase in the number of Lewis guns and machine guns ; but we have to consider, apart from the question of fire power, the various uses of foot soldiers bearing hand weapons on the data furnished by actual war experience. An advocate for the retention of the number of riflemen or bayonets that we took into the field in 1914 is on solid ground, and it is for the reformer to show cause for drastic changes. We must suppose that the British infantry may claim in proportion to numbers its share in the praise by General von Kluck of "our incomparable army"—at Ypres the British rifle fire was often mistaken for the fire of massed machine guns. But the infantry soldier is not always fighting or marching, and yet is rarely idle. He becomes a roadmender, or light porter or an excavator in his spare time. In every regimental diary we find such records as the following : "The seven days were filled with all night working parties (every third night at Noreuil), camp improvements, training, a test stand-to, and in reconnoitring tracks, dumps and routes . . . On being relieved, the three companies spent the rest of the night digging a communication trench . . . the four days spent here were filled with real hard work."

One fails to see how such duties will be carried out by British battalions on their present war establishments, nor how the problem can be solved by mechanization.

In battle it is obvious that infantry must fight infantry and, other things being equal, numbers will prevail.

The following record is typical of a successful attack as it appears to the vanquished defenders, and similar extracts could be furnished from every regimental history. At Bullecourt, in March, 1918, "It was the enemy in mass formation approaching our almost obliterated front line. The S.O.S. was sent up, but was not responded to. It was probably never seen by our waiting gunners . . . The Germans were almost shoulder to shoulder; it was impossible to miss them and heavy losses were inflicted. But as soon as one wave went down before our fire, others pressed in from behind, *and by sheer weight of numbers the garrison was overwhelmed.*" In the case of battalion *versus* battalion, it would seem that the new British unit of 144 bayonets must always stand on the defensive against the foreign battalion and rely on its automatic weapons. Now the moral effect of the machine gun in the Great War is beyond dispute, but how much more than the average wastage of .303 ammunition the machine guns contributed it is easy to estimate. That occasionally machine guns got to windward of an occupied trench with devastating results is certain; on the other hand, one may read of cases like the following: "On the morning of the 25th [March, 1918], the Germans put down a heavy machine gun barrage on the village; it lasted about an hour; there must have been thirty machine guns firing at least; *a few men lining the canal were hit.*"

Investigation of the evidence for awarding the Victoria Cross and other honours shows that machine guns were often captured single-handed. Chief Petty Officer George Prowse, R.N.V.R., seems to have made a *spécialité* of such exploits, alone or with a small party of braves. The military authorities could have pointed the moral by multiplying these machine gun destroyers, but they have gone on the other tack and increased the number of machine guns per battalion, which now fills half a mile of road space with its impedimenta. Moreover, the commanding officer is given a new orientation, and his mental attitude must undergo a radical change. Realizing that his power of offence or defence no longer resides in his bayonets but in automatics, he turns to the artillery manuals for inspiration and ideas in handling what is in truth a battery of machine guns. He may be styled officially an infantry commander, but he no longer commands infantry, for the half dozen platoons of riflemen who figure on his ration return can do little more than undertake the duties of local protection.

Casualty returns show that sickness and enemy fire take equal toll of all; the bullet and the shell do not discriminate. The battalion with 800 bayonets may lose 25 per cent. and carry on comfortably with 600 men, but a similar percentage of loss in the "reorganized" unit would leave it with companies of 72 rank and file, half of whom are Lewis gun numbers. Moreover, in depleting infantry units of their riflemen, the War Office apparently ignores an essential factor in the case.

The true automatic rifle is bound to appear in the near future. In March last, Sir L. Worthington Evans even went so far as to say that he "rather hoped we had got it." The Thompson anti-bandit gun or *pistolet-mitrailleur* has been developed into a self-loading semi-automatic rifle capable of discharging thirty aimed shots a minute, and the army that adopts this weapon will be rid of the Lewis gun and its congeners, with their mechanical appliances, transport wagons and pack saddlery. The men now employed as gun crews will revert to duty as riflemen and the company commander at least will resume his original functions. It may be found that in every infantry battalion the personnel now absorbed by sixteen Vickers guns (168 all ranks) will be more usefully occupied with Thompson rifles in their hands. But the mechanicians who hold the British Army in a firm grip to-day, and, having abolished the horse, are now trying to abolish the foot soldier, will not relinquish their position without a struggle; so we shall no doubt have to wait until some of the smaller States fall out, and find enough money to equip their conscripts with a £10 automatic rifle, before our Army Council realizes once more the potency of the Thinking Bayonet.

RECENT OPERATIONS OF THE ITALIAN TROOPS IN LYBIA

By LIEUTENANT-COLONEL A. G. COPPI.

(Italian Military Attaché in London).

THE occupation of the two Colonies, Tripolitania and Cirenaica, which Italy, in the years preceding the Great War, had extended almost to their extreme southern limits was reduced, during the first period of that war, to the possession of a small belt of land at a very little distance from the coast. This shrinkage was caused partly through rebellions stirred up by the enemy, and partly by the withdrawal of the troops which were necessary in the principal theatre of war. After the termination of the War, it was the Italian Government's chief aim to strengthen its hold on the two colonies, and, principally in the interior, to suppress all centres of revolt, to revive traffic on the principal caravan routes, and to render access to the sea ports safe for goods and merchandise coming from remote regions.

The indecision of the policy pursued by previous Ministries, which had tried in turn force, flattery and persuasion, resulted in obtaining any but the effect desired. Further, at the time, Italy was labouring under internal discord and social disturbances, for which the weak Liberal Government, then in power, was unable to find a remedy. It was difficult, therefore, to use an army sufficiently strong to impose the needful coercion on the territories that had been evacuated. It was only on the coming into power of the Fascist Government, when peace and order were brought to Italy internally, that some thought was given to reconquering the ground lost in the colonies.

The first operations had the result of dispersing and suppressing every rebel centre in the vicinity of the coast, thus securing tranquillity in the territory immediately adjacent. But there was still a great deal to do, and towards the end of 1926 the situation was the following: The southern boundary of the territory in the actual possession of Italy was shown by the line Gadames-Dergi-Misda (with a strong bend inwards in the neighbourhood of Kabao and Jeffren) Bir Gedabbia-Sirte in Tripolitania, and in Cirenaica the isolated zone of Jedabbia-Zuetina, and the line Jemines-Tillinum-Mekili (with a perceptible bend in between these last two localities) Bir Hakeim-Giarabub. The political situation between these two limits and the coast was tranquil and satisfactory in

Tripolitania, fairly peaceful in Cirenaica, where however the hostilities of the Duar rebels of Mid Jebel still caused slight anxiety.

As a matter of fact, in the spring of 1927 the propaganda of these rebels amongst the population already subdued was such that disorders took place in the territories included between the occupation of Tolmetta-Merg and Haina-Beda, separating this portion between them, and pushing the influence of the rebel chieftains in that zone on to the coast. Nevertheless the arduous operations of the Italian troops in the summer of 1927 re-established the situation, and the rebels remained hard hit.

Parallel to these operations and profiting by the opening of the market of Ajedabia, towards which many tribes, uncertain or dissenting, were turning, an active policy of persuasion and propaganda was carried out, resulting in the surrender of Saied er Redà es Senussi who was deported to Italy. Contact with the tribe of the Megarba Sciammach was initiated, and their manner although inclined to be hostile was not decisively so, and the same Senussi permitted our troops to advance to Lectafia and Agheila and to erect an advance magazine in the last-named territory. In Tripolitania, in the meantime, the market of Sirte was opened, where the opportunity to draw near to Saleh el Ateush, chief of the tribe of the Megarba Raedat, arose; he, however, maintained a decidedly hostile manner.

The Minister of the Colonies, in the meantime, visited both Tripolitania and Cirenaica, and in agreement with the Governors of the colonies had studied a plan of occupation and action to be carried out during the winter season of 1927-28, with the idea of extending actual Italian rule towards the interior and along all the front of occupation from the confines west of Tripolitania to that east of Cirenaica, so as to avoid dangerous and damaging infiltration of the enemy, as well as their devious insinuations which had proved fatal previously to our advanced positions isolated in those territories.

The general lines of the plan of action were the following :—

- (a) Operations to effect the joining together of the two colonies along the curve of Sirte, resolving in this manner the situation in regards to the tribes of Megarba.
- (b) Operations for the occupation of the chain of Oases along the 29° parallel and, viz., the Oases of Jofra-Sella-Marade-Aujila Jalo.
- (c) Operations for the consolidation of our effective dominion and military political position in all the territories north of the 29° parallel.

All these operations to be divided into two periods.

1st Period. (a) One column of the Tripolitanian troops to move from Sirte, almost parallel with the coast for the itinerary Sirte-Nufilia-Merduma-Wadi Fareg, to attack and defeat the tribe Megarba Raedat with the help of:—

- (b) A column of Cirenaican troops to move from Agheila towards Merduma for the same reason ;
- (c) The two above-mentioned columns were then to reunite under one command ;
- (d) One further column of Tripolitanian troops was also to occupy Bungeim on the road to Jofra ;
- (e) One group of Tripolitanian troops remained in Reserve and in observation of the Central Sirtica ;
- (f) One column of Cirenaican troops was to operate in the zone comprehending Agheila and Ajedabia and between Wadi Fareg and the coast with the idea of stopping the Megarba Sciammach from going to the help of the Raedat ;
- (g) A group of Cirenaican troops was to remain in reserve in the Benghasi region ;
- (h) The troops of Cirenaica situated in Central Jebel to undertake offensive operations, with the object of impeding the rebels in that zone from molesting other columns during the progress of their operations ;
- (i) The two native battalions of the Tripolitanian troops to be situated in the vicinity of a port of embarkation and kept at the disposal of the Government of Cirenaica and to be eventually used in Central Jebel.

2nd Period. As soon as the resistance of the Megarba, both Raedat and Sciammach, should be crushed and territorial continuity assured between the two colonies across the region of East Sirtica the operations were to continue in the following manner :—

- (a) The Tripolitanian troops to occupy, in the first place the Jofra Oasis and then that of Sella.
- (b) The Cirenaican troops to occupy the Oasis of Aujila Jalo and thence to point towards the Oasis of Marade which would also be occupied.
- (c) It was hoped that the arrival of the Tripolitanian troops at Sella and that of the Cirenaican troops would be simultaneous. In any case, the troops of the two colonies were to effect their junction on the Sella-Marade line, thence turning northwards, searching all the territory of the Megarba between the Sella-Marade line and the coast.

The troops available for the above programme were the following :—

Group A. (under the command of General Graziani).

- 4 battalions (I & IV Lybians, XX & XXV Eritreans).
- 2 groups of Saharians (3rd & 4th).
- 2 platoons Spahis.
- 1 band of irregulars.
- 1 Lybian battery.
- 1 Caravan of supplies with about 3,000 camels.
- Services.

Group B. (under the command of Colonel Pintor).

- 3 battalions (VI Lybians and XVII & XIX Eritreans).
- 1 squadron of Savaris.
- 1 platoon Spahis.
- 1 Lybian battery.
- 1 caravan of supplies with about 1,600 camels.
- Services.

Group C. (Reserve).

- 1 Eritrean battalion.
- 1 squadron of Savaris.
- 2 batteries (1 Lybian and 1 mechanized).
- 1 section armoured cars.
- 1 company engineers.
- 1 centuria of Fascist Militia.
- 1 platoon of cyclist rifles.
- Services.

On the 28th December, 1927, all these forces were gathered in the zone between Bir Geddabia and Sirte. Group A was destined to operate against the Megarba Raedat together with the column of Cirenaican troops. Group B. was destined to operate in the direction of the Oasis of Jofra not beyond Bungeim in the 1st Period. Group C. was kept in central reserve.

In Cirenaica the forces to be used were divided into two groups, viz., one group mobile troops comprising :—

- 6 battalions of Eritreans (of which one in reserve for eventual use in Central Jebel).
- 3 squadrons of Savaris.
- 2 squadrons of Meharists.
- 1 band of irregulars.
- 1 1/2 battery pack artillery (6. pieces).
- 1 section artillery on camels.
- 1 group armoured cars.
- Services.

The 2nd Group would be formed of troops occupying the territory and include :—

1 cohort of Fascist Militia.

2 groups of Spahis.

1 mechanized battalion.

Sections of artillery and machine gunners in fixed positions.

Some armoured cars.

Services.

The mobile troops were assembled near the base of Ajedabia, with the exception of the reserve battalions situated at El Abiar and two Eritrean battalions already situated at Agheila. With all these units the column would be concentrated under the command of General Mezzetti, who was charged to traverse the territory between Ajedabia, Lectafia and Agheila.

The column was formed of :—

3 Eritrean battalions (VI, XIV, XV).

3 squadrons of Savaris (V, VI, VIII).

1 squadron of Meharists (III).

1 band of irregulars.

1 battery of Eritrean pack artillery.

1 section artillery on camels.

1 group armoured cars.

1 unit motor transport.

1 camel caravan.

At Agheila another column was formed under the command of Colonel Maletti, as follows :—

3 Eritrean battalions.

1 squadron of Savaris.

1 battery.

1 caravan supplies.

Services.

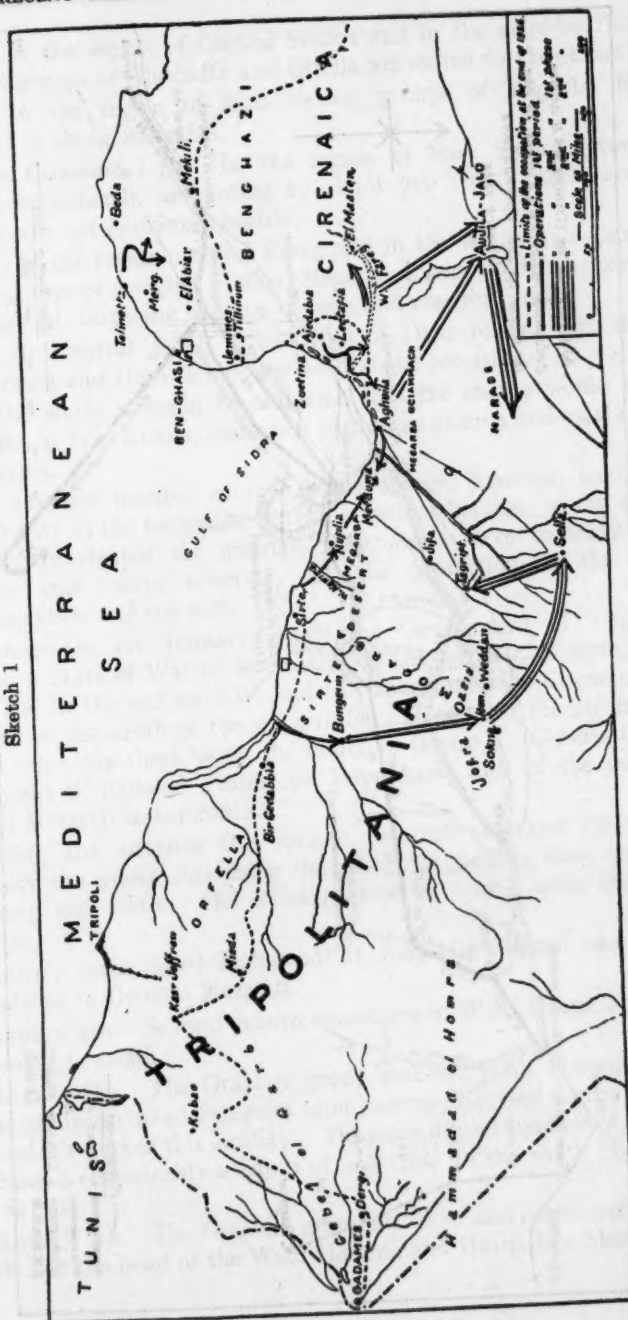
This column was to co-operate with Group A. of the Tripolitanian troops going towards Merduma.

The situation of the native groups of rebels was found to be approximately as follows :—

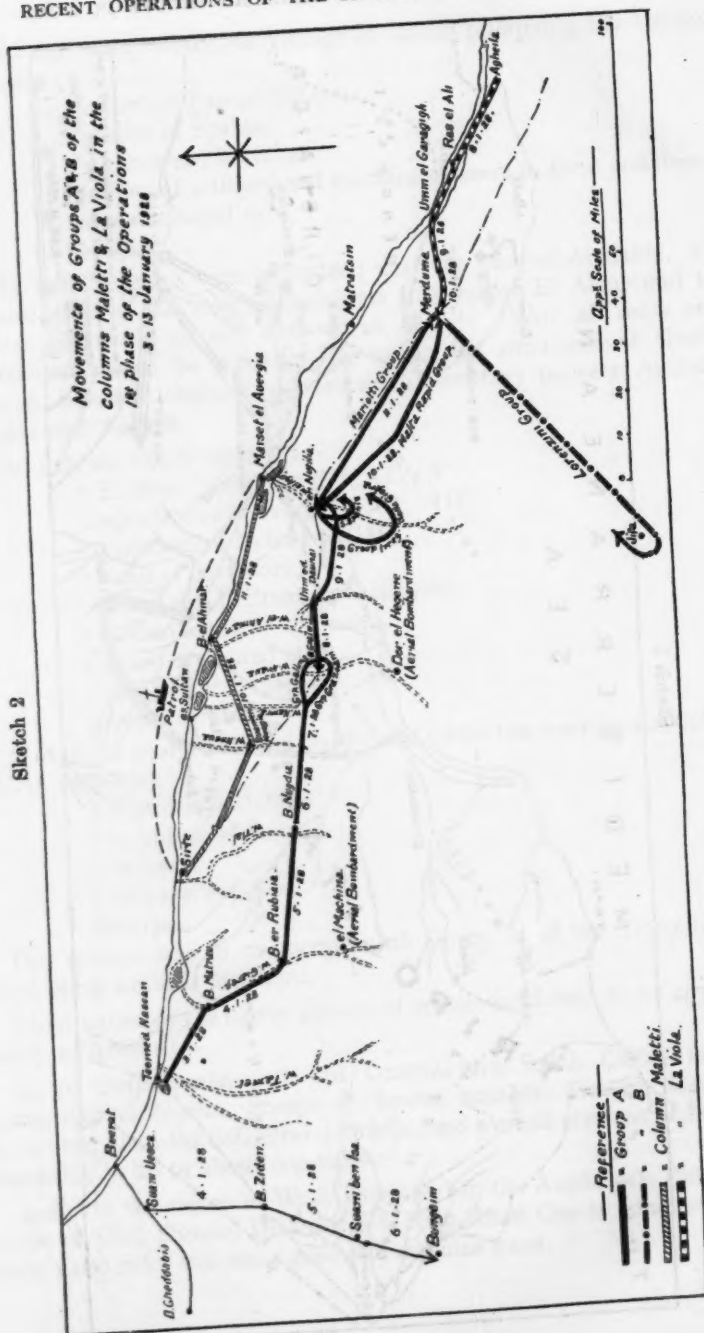
(a) *In Tripolitania.* 1st. In Central and South Chibla and in Hammadad el Homra, groups of Tuareg nomads, Zivitan, Rogeban, Mscia-Scia, Ulad Bu Sef, several Orfella, and a small element of Fezzan, amounting in all to about 800 rifles.

2nd. In the region of Wadi Fareg and in the Aujila Jalo Oasis and groups of Ulad Sliman, Ulad Bu Sef, Riaha, Ulad Chenis, amounting to about 1,000 rifles and some guns and machine guns.

Sketch 1



Sketch 2



3rd. In the region of Central Sirtica and in the neighbourhood of the coast, groups of Ghedadfa and Orfella amounted to about 600 rifles.

4th. In the region of East Sirtica, groups of Megarba Raedat amounted to about 800 rifles.

(b) *In Cireniaca.* 1st. In the region of East Sirtica, groups of Megarba Sciammach, amounting to about 700 rifles; their attitude, however, was not decisively hostile.

2nd. In the region of Wadi Fareg and in the Aujila Jalo Oasis and Marade, groups of Auaghir, Fuaker, Megarba, Zueiar, under the command of the Senussi, disposing of some cannon and machine guns.

3rd. In Central Jebel, three tribes of Duar rebels, viz., those of Abid, Braasa and Hasa, altogether with about 700 rifles.

On the whole it could be reckoned that the enemy would number 3,700 rifles in Tripolitania, and 2,600 with some cannon and machine guns in Cirenaica.

The superior number of the Italian troops, however, would have counted only at the beginning of the operations because, as the columns gradually penetrated the interior, they would have to leave behind garrisons and troops necessary for the protection of the line of communication and convoys.

Events.—On 1st January, 1928, the Government of Tripolitania declared a State of War to be existing in the territory of Sirte, Orfella, Misda and in the section S.W. and the Government of Cirenaica in the territory of the south of the 30° parallel and west of the 29° meridian. On the same day there began the march of Group A. (General Graziani) and Group B. (Colonel Pintor) in Tripolitania and of the column of General Mezzetti in Cirenaica.

During the advance the various columns searched the country, especially the *wadis*, disarming the rebels, destroying their camps and capturing the cattle. The aviation kept in touch with the various columns.

January 3rd. Saied Mohamed Er Redà Es Senussi came in and surrendered to General Mezzetti.

January 4th. Several groups encamped in Wadi Hneua surrendered to General Graziani.

January 6th. The Graziani group reached Wadi Hamma and the Pintor group occupied Bungeim after having dispersed a group of rebels to the north-west of this locality. The same day a squadron of aeroplanes bombarded efficaciously a camp of 400 tents to the south of Nufilia as well as Jifa.

January 7th. The Graziani group attacked and dispersed the camps situated at the head of the Wadi Hamma and Hraua (see Sketch 2).

In Cirenaica the columns of General Mezzetti reached Agheila without any disturbances.

At this point the Command of Tripolitania decided to effect the clearing out of the territory inclusive between the itinerary of the Graziani group and the coast. For this object a battalion of Eritreans and a squadron of Savaris were moved from Sirte towards Bir-Geddabia. The same day the march of the column of Colonel Maletti from Agheila began in Cirenaica.

During the night of the 9th the column of General Graziani fought and took Nufilia, attacking the rearguard of the enemy who retreated towards the south.

January 10th. General Graziani, having learned that a part of the enemy troops were marching towards Merduma, ordered a flying column to go there. It was composed of:—

Groups of Spahis and Saharians.

1 battalion of Lybians mounted on camels.

This column with nine machine guns, was under the command of Colonel Malta.

From Agheila General Mezzetti sent the Lorenzini Group, composed of armoured cars, to cut off the retreat of the rebels towards the South-West, the irregular group of Tripolitarians being sent from Nufilia with liberty of action and provisions for ten days.

January 10th. The Malta column and that of Maletti reached Merduma, and on the following day, January 11th, the armoured car group of Lorenzini, closely followed by one battalion Eritreans, 6th Savaris and the 4th group Saharians, pursued the enemy towards Jifa and forced them to fight, causing them heavy losses besides capturing all their cattle.

January 12th. This group reached Jifa and the 13th again entered Merduma on its way back.

Thus ended the first period, and the results gained were those proposed, viz., to reunite the Colony of Tripolitania with that of Cirenaica across the territory of Sirte already occupied by the Megarba rebels, and eliminate the danger that the mass of the said Megarba would have caused on our flanks in any future operation towards the south.

The Megarba Raedat were definitely separated from the Megarba Sciammach, disbanded, demoralised and hunted towards the desert.

The operations of the second period were divided into two phases. In the first phase the Tripolitanian troops were to occupy the Oasis of Jofra, those of Cirenaica the Aujila Jalo Oasis; while in the second

phase, the first mentioned troops would have to occupy Sella and the latter Marade.

The Graziani, Group who on the 17th January had entered Nufilia, on the 4th February reached Bungeim where it joined the Pintor Group. Aerial reconnaissance had discovered the presence of a strong nucleus of rebels in the Jifa zone. In Cirenaica all the mobile forces had again reunited in the territory of Agheila.

It was decided to proceed immediately with the disarming of the Megarba Sciammach who had gathered on the two banks of the river Wadi Fareg. With this object in view a column commanded by Lieutenant-Colonel Garelli and composed of

- 1 Eritrean battalion ;

- 1 squadron Savaris ;

operated between Agheila and Lectafia.

One column under General Mezzetti composed of

- 2 Eritrean battalions ;

- 1 band of irregulars ;

- 1 battery and a section of artillery ;

acted on the south bank of the Wadi Fareg.

One column composed of :—

- 2 Eritrean companies ;

- 1 unit tanks and supplies ;

operated on the northern bank of the Wadi Fareg and lastly :

One column under the command of Lieutenant-Colonel Maletti and composed of :—

- 1 Eritrean mechanized battalion ;

- 1 group armoured cars ;

went towards south-east in the Maaten region.

All these operations took place with precision, giving rise to numerous partial conflicts and procuring the capture of some hundreds of rebels, 3 cannon, 15 machine guns, 500 rifles, 400 camels and several hundred sheep. On our side we had only three wounded, of which one was an officer.

February 8th. The Tripolitanian troops, divided into two columns and one reserve group, started the march towards the Oasis of Jofra, and on the 12th February the Cirenaican troops, also divided into two columns, left the south bank of the Wadi Fareg for Aujila Jalo.

February 13th. The Pintor Group, occupied the town of Sokna in the Oasis of Jofra, and on the 14th H.R.H. Duca delle Puglie, at the head of :—

2 Groups of Saharians ;
1 squadron of Spahis ;
1 band of irregulars ;
overcame the rebels and occupied the cities of Hon and Weddan to the east of Sokna.

In this last locality several hundred rifles were taken and a large quantity of supplies.

In the Jofra region a garrison of :—

- 1 battalion infantry ;
- 2 squadrons of Savaris ;
- 1 battery ;

were left and, for the defence of the line of communication, a section of armoured cars.

All the other mobile troops of the Tripolitania made for Weddan towards Sella to carry out the last phase of operations.

February 22nd. The bulk of the rebels were met near Sella. The Oasis was attacked from the south and north-east, and at 14.30 o'clock was taken, after having caused heavy losses to the enemy.

In the meantime in Cirenaica the column of General Mezzetti on the 23rd February came in sight of the Oasis of Aujila, at a little distance from the Maletti column.

The population and the chiefs of the Aujila Oasis came to meet our troops and surrendered.

On 24th February and the following days the troops camped between Aujila and Jalo, proceeded to disarm the population, capturing several hundred rifles and a large quantity of ammunition.

News arrived of a strong gathering of Mehalla rebels at Tagrift with a force of 1,500 rifles.

General Graziani decided to attack without delay, and on the 23rd February one of our columns left Sella for Tagrift. The column was composed of :—

- 2 battalions ;
- 2 groups Saharians ;
- 1 platoon Spahis ;
- 1 section artillery ;
- 1 band of irregulars ;
- 1 convoy of 3,000 camels.

This column was under the command of Colonel Gallina.

On 25th February they came into contact with the enemy who had established their defence along the lines of sand dunes and the rocky heights which dominate the Tagrift Wells.

As soon as our troops deployed they were attacked furiously by the enemy who was trying to surround them and fall on the convoy, but this was foreseen by our units who going round the rocks, occupied by the enemy and inaccessible on the front, were thus able to gain a complete victory.

In this conflict which had been the most important of this period, the enemy left on the field about 300 dead and several hundred wounded, whereas we lost 5 officers and 54 men and 6 officers and 156 men wounded.

Then finally proceeded the last act of the operations, that is the conquest of Marade. This was effected by the column of General Mezzetti which left Aujila the 10th March and was composed of:—

- 3 native battalions ;
- 1 Eritrean battery ;
- 1 squadron of Meharists ;
- 1 band of irregulars ;
- Services.

On the morning of the 18th this column occupied Marade and disarmed the population.

The last cycle of operations was therefore terminated. Tripolitania and Cirenaica, without interruption of their territorial continuity, were in our possession to the 29° parallel.

The only thing now left to do is to carry on the ordinary active policy of eliminating the last small groups of rebels who might have escaped and who are still wandering divided, demoralised and lacking supplies.

THE INTERNATIONAL SITUATION

A REVIEW OF EVENTS IN 1928.

THE year 1928 cannot in any way be regarded as having been marked by events of far reaching significance in international relations. Several weighty problems which have agitated the world since the close of the Great War still remain to be solved. Above all, the thorny question of disarmament appears to stand even further from a partial or temporary solution than it did at the close of 1927 ; its further discussion should, however, be regarded as shelved and not abandoned.

For this state of affairs the main cause seems to be the influence exercised during the whole year by internal politics, as well as the governmental changes that have agitated many of the leading statesmen and administrations of the world. A further contributory source to delay in the settlement of certain big European international questions can undoubtedly be traced to the illnesses of the Foreign Ministers of Great Britain, France and Germany during the recent summer. The year 1928, moreover, was overshadowed by elections to an unusual degree. The spring saw important general elections in Japan and Poland ; next there came a difficult electoral period in both France and Germany ; later, there took place the Presidential Election in the United States ; while, in the last instance, a general election in Rumania brought about a complete change in the personnel and policy of the Government of that country. The parliamentary crisis in Yugoslavia, occasioned by the persistent attempt of the Serbian element to dominate the remaining two-thirds of the various nationalities of the Triune Kingdom continued throughout the year, and it grew more acute.

In those countries where there were no elections, the weaknesses or ailments of parliamentary or democratic government showed no diminution. In Italy, Poland, Lithuania, Spain, Greece, Turkey and, lastly, Yugoslavia, the direction of state affairs in matters of foreign policy and of the control of armaments seems to be lapsing more and more into the hands of Dictators. In Italy the Ministry of the Colonies has been assumed by Signor Mussolini, whose personal influence thus becomes paramount and complete in all exterior affairs.

An interesting feature of the year 1928 in Europe is the manner in which the Governments of Great Britain and France, were, if anything, thrown more closely together in international politics. The reasons for this greater intimacy are many; chief among them are, firstly, the growing influence of Germany, not only in politics and in commerce, but also on the League of Nations; secondly, the estrangement of France and Italy. The former of these manifestations may largely be ascribed to the stronger nationalist feeling which has been making itself felt both in Germany and France, this being the outcome of the elections which have shown both countries to be inclining to the Right, and away from international Democratic Socialism.

Then, again, the unfortunate differences of opinion that arose between the United States and Great Britain over the problem of naval reductions, caused Great Britain to take counsel with France, in order to find a solution of the impasse, while the latter also inclined towards her ex-ally as a result of the tension in her relations with Italy. This Power then, in turn, feeling no longer so secure of the traditional support of Great Britain in her points of divergence with France, has turned her attention to political interests in South Eastern Europe, chiefly in the Balkan Peninsula, and Turkey.

The resentment aroused in Germany by the constitution of the "Polish Corridor" to Danzig as the result of the Treaty of Versailles shows no sign of diminution. If there is any question that might arouse a national aggressive movement in Germany it will be found to reside herein. Nothing is more calculated to unite the many divergent German political sections more than this, in Germany, so-called violation of national sentiment.

Outside Europe, events have not exercised much influence on international relations. The Chinese civil war petered out after the death of Chang Tso-lin and some attempt seems to have been made to centralise the Chinese administration, now transferred from Peking to Nanking. But it would be early, and also somewhat optimistic, to pretend that the question of China is settled. The position of Manchuria is likely to become far more interesting in the future; for there is little doubt but that Japanese interests are greatly exercised over the desirability of maintaining Manchuria in a semi-independent condition, under Japanese direction—either overt or disguised—in order to act as a buffer state between Soviet Russia and Japan. The parallel with Afghanistan at once springs to mind.

The mention of the latter state draws attention to that country where the headlong attempt of King Amanullah to force western methods of government and of life on a recalcitrant population had succeeded, even before the end of 1928, in creating a formidable opposition to his rule.

In South America at the close of the year, the century-old dispute between the inland Republics of Bolivia and Paraguay threatened to end in war, but this now shows promise of being settled peaceably.

The principal diplomatic event of the year was, undoubtedly, the adoption by the majority of European States of the American proposal for a Treaty to Outlaw War as an instrument of policy. The signature of this Treaty by fifteen of the greatest powers of the world in August, 1928, may, or may not, mark the commencement of a new era in international relations: time alone can show. Whatever the motives underlying the American action may have been, there is little doubt that the ratification of the "Kellogg Pact," as it is called, by the Senate of the U.S.A. is likely to result in a renewal of American interest in European affairs.

THE LEAGUE OF NATIONS.

A further series of European problems can only be considered in conjunction with a review of the work of the League of Nations for the past year.

It cannot be claimed that the League has succeeded in achieving any result of major importance. The question of Disarmament may be regarded as definitely postponed, though for how long it would be difficult to forecast. On the other hand, progress has been made in clearing the ground with regard to some definite decision being taken in the burning questions of the final assessment of German Reparations and of the evacuation of the Rhineland. At any rate these problems are now to be faced by the three principal governments concerned. Further, some little progress has been made by the League during the year in the matter of Arbitration Treaties and Declarations of Non-aggression.

The return of Spain and of the little Republic of Costa Rica to the League was effected. The latter event, in particular, is regarded as a matter of some significance since this accession of Costa Rica to the League entailed a declaration of policy by the Council of the League with regard to its attitude towards the American Monroe Doctrine. Again, when, at the close of 1928, the Council of the League exerted its influence towards preventing a war between Bolivia and Paraguay, it was noteworthy that the League was able to do so without giving umbrage, either to the Government of the United States or to the Pan-American Conference, to whose Council the task of arbitrating between the two Republics had been entrusted. The fact that the League was able to co-operate in this matter, through the good offices of M. Briand, acting in conjunction with the American representatives in Paris, gave great satisfaction at Geneva.

Of lesser import is the intervention of the League in two tedious European problems, the Polish-Lithuanian dispute and the question of Rumano-Hungarian "optants." Although the various states concerned have so far not proceeded further than words, there has at any rate been some relaxation in their former uncompromising attitude. Thus far the League may be said to have paved the way for some kind of settlement.

Turkey has evinced a desire to work with the League, and in so doing has definitely implied that she would do so quite independently of Soviet Russia. Egypt and Iraq have also expressed a wish to participate in the tasks undertaken at Geneva. Persia has, in fact, actually joined the League. Finally, the Chinese Government has begun to renew its overtures for active participation in the work of the League. But how far these Oriental States are pressing their claims for admission to, or co-operation with, the League from a desire for recognition as the equals of Western States is not altogether clear. It might be a matter for speculation whether the League in reality stands to gain great advantages from full collaboration with their Governments.

One aspect of the work of the League remains to be mentioned; this is the work of the newly appointed Economic Committee. The latter is undoubtedly setting to work very methodically and thoroughly in its study of European and world economics and the view is held in well informed quarters that more good might accrue from these deliberations than is now apparent.

UNITED STATES THE PEACE PACT

THE International Agreement known as the Kellogg Peace Pact "to outlaw war" was ratified by the U.S. Senate on 15th January. To allay anxiety in that country a separate affirmation was pronounced that the Monroe Doctrine remained intact. President Coolidge and Mr. Kellogg signed the Senate resolution on 17th January.

Note.—M. Briand, Foreign Minister, introduced a Bill in the Chamber on 17th January for ratification of the Peace Pact. The Bill was referred to the Foreign Affairs Committee.

THE CRUISER BILL

By agreement between all parties the Chairman of the Senate Naval Affairs Committee introduced the Cruiser Bill, after which the Kellogg Peace Pact was given right of way. The latter having been disposed of, the Bill for this great programme of warship construction again came up for consideration.

Senator Hale, in his speech, asserted that there was no conflict between the Treaty and the Cruiser measures, and that the ratification

of the former did not lessen the need for the maintenance of a "Treaty Navy." He argued that the Washington Agreement "did serve notice on the world that the 5/5/3 ratio was the basis upon which the United States proposed to keep its Navy." Aided by maps he stressed the positions and numbers of British bases and their influence on the cruiser problem. Summing up, he said "The one insurmountable bar to reaching an agreement at the Geneva Conference for a proportionate reduction in naval armament was the divergent naval needs of this country and Great Britain in regard to cruisers. The latter's cruiser force, with her naval stations which everywhere command the commerce of the world, give her control of the seas. If we are to keep up our foreign trade and build up our ocean commerce we must see to it that that ocean commerce is guaranteed protection in peace and in war, without which it is at the mercy of another and competing country, and however friendly our relations with that competing country may be, such a position is not to be tolerated."

"Supremacy of the seas," he continued, "we do not seek, but the rights of our commerce when we and the rest of the world are at peace, when we are neutral and other countries are at war, and when we are ourselves belligerents, we must insist upon. . . . For the reasons above given, it will be readily seen that it is of the utmost importance that these cruisers have a wide cruising radius, so that they may not only spend as much time as possible upon their stations, but at all times have enough fuel on board to reach their home ports. The bigger the cruiser, naturally, the greater its capacity for carrying fuel, and it is all important for us to construct for our cruiser service the largest type of cruiser available under the Washington Conference. . . . Smaller types of cruiser with lesser cruising radius and lesser armament would be of proportionally less value to us, and it would seem that there would be little or no justification for our building such ships in the future. The British on the other hand, with their great string of naval stations and their adequate facilities for fuelling and repair all over the world, naturally favour the building of smaller and less expensive types of ships, of which, for the same appropriation, they can secure more separate units. I cannot see how the American position which calls for the right to build cruisers of any size and armament up to the Treaty limitation, can at any future conference on limitation of armaments be modified without giving up all possibility of maintaining a navy equal to that of any other country in the world."

The Cruiser Bill was passed by the Senate on 5th February by a large majority. The Bill authorises the construction of fifteen 10,000 ton cruisers and one aircraft carrier.

The Senate have not complied with the wish of the President that the rate of construction should be left to his discretion, and have retained in the Bill the time clause which decrees that the cruisers shall be laid down at the rate of five a year for the next three years.

An important amendment was accepted favouring a treaty with the principal naval Powers to regulate the conduct of belligerents and neutrals at sea.

THE UNITED STATES MERCANTILE MARINE

IT is as yet too early to estimate the full effect of the Mercantile Marine Act, which received the President's approval last May, but it is evident that the regulations designed to encourage private shipping interests are meeting with some measure of success.

At the time the Mercantile Marine Act was introduced, Mr. Coolidge announced his conviction that "the Government should get out of the shipping business" as soon as possible, but the Act as finally approved was virtually a compromise between the desire to get rid of an unprofitable State enterprise and the assumed necessity for a large American owned merchant marine both in peace and war. The provisions of the Act fall, indeed, into three classes; those designed to encourage private shipping companies; those designed to increase the efficiency of Government owned ships and to fight foreign competition; and those by which the Mercantile Marine might be made an efficient naval auxiliary. These objects are, in the nature of the case, to some extent interdependent.

The methods adopted to stimulate private interests were:—

- (a) The provision of mail contracts on favourable terms.
- (b) The loan to shipbuilders at a low interest of sums to cover three-quarters of the building cost of new ships.
- (c) The sale of government owned ships under conditions more satisfactory to independent companies.

The Shipping Board were at the same time authorised to remodel and improve their existing vessels and were given a fund with which to fight foreign competition.

As regards naval interests, construction loans were only to be granted to vessels designed "with reference to their possible usefulness as auxiliaries to the naval and military services of the United States."

In view of the high running costs of American ships and various other difficulties, these measures did not promise any rapid revival of United States shipping, but the prominence which has been given to naval affairs since the Geneva Conference has had a marked influence on the course of events. Reference is continually being made to the dangers to which the country is exposed by its dependence on foreign

shipping. Comparisons of naval strengths are accompanied by comparisons of British and American mercantile resources. The spirit of competition is being aroused. All this may not have much effect on the American business man unless accompanied by some further financial concessions, but there is no doubt that if the people of the United States are brought to believe that a large Mercantile Marine is essential for their prosperity and security, they will proceed to acquire one, even at considerable cost to themselves.

It is in this light that various newspaper reports of grandiose shipping construction schemes should be viewed. The schemes may be impossible, but they serve to maintain interest and are therefore valuable as propaganda. A recent report by the Shipping Board is on rather similar lines. After stating that the vessels to be built under the construction loans will, almost without exception, be of a combined passenger and cargo type with speeds of from 13 to 20 knots, the report proceeds:—"The projects acted upon and now being considered represent but a fraction of the number expected to be advanced during the next year or two. The postal authorities are carrying out the programme of contracts with commendable promptness and nearly every contract must by its nature result in new construction. The ball has started rolling and is gathering momentum, and there is every indication that another few years will find the American Merchant Marine equipped with an adequate fleet of modern efficient ships plying profitably on the essential trade routes built up by the Shipping Board."

The ball certainly seems to have started rolling. The postal authorities have already awarded twenty mail contracts, which it is stated call for the early construction of twenty-four ships, with an additional six ships later on. The contracts awarded include weekly services from New York to Copenhagen and from San Francisco or Seattle to the Far East, and bids have been invited for a service from Savannah to Liverpool *via* Brest, and to Bremen *via* Plymouth. There are also to be services to the Cape, Mediterranean and Black Sea, a ten days' service from Portland to Manilla, and a fortnightly service to West African ports. Among several contracts for the carriage of mails to Central and South America, there is one to Rio which requires vessels of 18 knots speed.

Six ships of approximately 8,000 tons are now being built under the construction loan and a proposal for the building of seven larger vessels is now being considered; details of the ships will not be made public until a loan is approved.

MERCHANT MARINE RESERVE

The Merchant Marine Reserve authorised in 1925 is now taking definite shape as the necessary funds are becoming available. Since

August last one thousand merchant officers have been granted commissions.

The Navy Department are organizing groups of reserve officers on board the more important vessels that will be used as naval auxiliaries in war time. These ships will fly the Naval Reserve flag provided that the master and not less than fifty per cent. of the officers have received commissions. So far, warrants to fly the flag have been issued to twelve vessels. The flag is a burgee pennant with an eagle on crossed anchors with a shield with thirteen stars and stripes on a blue field.

AVIATION IN CENTRAL AMERICA

UNITED STATES' INFLUENCE.

BACKED by the United States Post Office Department, American interests have launched an ambitious scheme for commercial air services in Central America and the Caribbean, which it is no doubt intended to extend to South America.

The two main routes to be developed are—

- (a) Key West to the Canal Zone.
- (b) Key West to Porto Rico.

(a) *Key West to the Canal Zone.*

This route is 1,640 miles long, and provides for stops at Havana (Cuba), Merida (Mexico), Belize (British Honduras), Tegucigalpa (Honduras), Managua (Nicaragua), San Jose (Costa Rica), and Cristobal (Panama Zone).

Under the terms of the Pan-American Convention, any signatory nation has the right to prohibit the planes of another nation from flying over fortified zones such as the Canal Zone, but in doing so equal treatment must be given to the aviation companies of all signatory nations. It appears that the U.S.A. have already declined to give permission for planes of the Scadta, a Colombian Company, to land in the Canal Zone, and it is therefore doubtful whether they have the right to afford similar permission to an American Company.

The Post Office Department has awarded a contract to Pan-American Airways, for carrying mails over this route with a daily service, and it has reserved to itself the right to include Guatemala and Salvador in the route and also to extend it southwards to Colombia, Venezuela, Trinidad, British Guiana and Dutch Guiana.

(b) *Key West to Porto Rico.*

This route is laid *via* Havana, Santiago de Cuba, Port au Prince, Santo Domingo to San Juan, Porto Rico. The Post Office Department

has received bids for the mail contract from both the Pan-American Airways and the West Indies Aerial Express. The award is being held up pending further investigation.

The Pan-American Company, however, has already signed a contract with the President of Cuba by which it is granted free and exclusive use of existing aerodromes in Cuba and every facility for carrying out its operations in that island. The terms of the contract are very favourable to the Company and amount to a monopoly.

It has also been announced that the Post Office has awarded to Pan-American Airways a ten years' contract for a thrice weekly mail service between Miami, Nassau, and the Bahamas.

According to the Press an organization has been formed in New York for controlling all the above developments, styled "The Aviation Corporation of the Americas." The Pan-American Airways Company will operate under the direction of this new organization.

BOLIVIA AND PARAGUAY FRONTIER FIGHTING IN SOUTH AMERICA

By MAJOR E. W. POLSON NEWMAN, B.A., F.R.G.S.

ALTHOUGH Bolivia has been the victim of armed aggression involving the violation of her territory and casualties among her frontier troops, she has agreed to accept arbitration in a situation where there was every provocation to declare war. On the 7th December last, three detachments of Paraguayan cavalry attacked Fort Vanguardia, an isolated post in the Chaco region, inflicting considerable casualties on the garrison and setting fire to the buildings which were flying the Bolivian flag. Although the region in question has long been a matter of dispute between Bolivia and Paraguay, the actual district round Fort Vanguardia has never even been claimed by the Paraguayans; and the same applies to Fort Boqueron, erected by the Paraguayans, which was subsequently taken by Bolivian forces.

The fact of the matter is that the Paraguayans have long wanted to expand into the Chaco, and have for many years been pushing forward their outposts in a disputed region, which is very inaccessible from the more densely populated part of Bolivia. As soon as news of the fighting reached the respective capitals, hasty mobilisations were ordered, and large numbers of volunteers made their way to the recruiting centres. Many Chilean officers offered their services to Paraguay, while a number

of British subjects, who had previously lived in Bolivia, gave in their names as volunteers for active service. While the Paraguayans, whose policy is to occupy territory first and discuss the matter afterwards on the basis of their increased possessions, were naturally quite prepared to accept the suggestion of arbitration, it took a little time for the Bolivians to get over their justified resentment and to accept a proposal that was difficult indeed for the injured party to swallow. The Paraguayans were merely trying to get as much as they could without precipitating hostilities, in which they could not hope to be successful; and the moment they saw that Bolivia meant business they saw an opportunity of gaining international sympathy by being the first to accept a peaceful settlement.

The keystone of international relations in South America since the War of Independence of 1825 has been the principle, accepted by all, that each one of the old Spanish colonies should, on becoming an independent republic, maintain the frontiers fixed by the Spanish Crown during the 300 years of Spanish rule. Thus Bolivia considered her natural boundaries to be those of that particular colony which was governed by the "Real Audiencia de Charcas," and this was accepted by her neighbours. As the whole Chaco region was incorporated by Royal Charter within this particular "Audiencia," it naturally follows that it should now form an integral part of the Republic of Bolivia. But, although these limits were perfectly clear in the documents of the period, it has proved very difficult in practice to fix the exact boundary lines, partly owing to the inaccessible nature of the country and partly because boundary rivers have changed their courses and many important landmarks have entirely disappeared.

The territory of the Chaco consists of a low-lying plain, with dense tropical bush and mosquito infested swamps, but it promises to become one of the wealthiest regions of the world. It forms a triangle, twice the size of England, between the Paraguay and Pilcomayo rivers, and is the point where Brazil, Bolivia, Argentina and Paraguay meet. The Paraguay River here is freely navigable, giving access to the River Plate at Buenos Aires, and 100 miles of the Pilcomayo are also accessible to shallow craft; so that Bolivia, with no access to the Pacific except through Chile, would greatly benefit in this area from the river communications with the Atlantic. The Chaco is mainly populated by Indians and has suffered from want of development, but in recent years the Bolivians have constructed roads into that region, so that it is now less remote from civilisation than in former times.

Strategically, the Paraguayans have the advantage of holding the Eastern bank of the Paraguay River, while their capital, Asunción, is

situated at the juncture of the Paraguay and Pilcomayo rivers, the latter waterway separating the Chaco from Argentina. The Paraguayan town of Concepción, about 125 miles further North, also on the Paraguay River, provides an additional base of operations, while Confluencia, 100 miles further North still, could be used for similar purposes if necessary. Communications between the capital and these points are maintained by river transport, and Asunción is connected with Buenos Aires, both by river and by the Argentine railways. The Argentine Government is, therefore, in a strong position to bring pressure upon Paraguay, which depends largely on supplies from this source. Although the Paraguayan army is a small force, with a peace establishment of about 2,500 all ranks, which in war could be greatly expanded by means of the "National Guard," a force could be put in the field at short notice for operations in a territory very close at hand, parts of which have already been occupied and strengthened by permanent outpost positions. Moreover, there is nothing to prevent the Paraguayans from seizing the initiative, and making such use of it as they could with the forces at their disposal, without serious interference from the Bolivians, who would take at least a month to put their army in the field in a theatre of operations about 800 miles from their capital.

The Bolivians, on the other hand, have a German trained army, numbering in peace some 4,200, and in war about 100,000. But this must be transported by rather primitive lines of communication before it could gain contact with the enemy. In this way much time would be lost and a considerable number of troops would be needed for communications duties, while the question of supplies would be one of considerable difficulty owing to lack of adequate railway lines and roads, and the nature of the country in the Northern Chaco. At the same time, there is little doubt that once the Bolivian army came in contact with the forces of Paraguay it would have little difficulty in driving the enemy back to or beyond its bases on the Paraguay River. It must, however, be taken into consideration that, while a considerable proportion of the Paraguayans are accustomed to the climate of great tropical rivers, over three-quarters of the population of Bolivia live at an altitude of at least ten thousand feet above sea-level, and that therefore a campaign in the Chaco region would be one of hardship for the Bolivian army.

Note.—The area of Bolivia (inclusive of the Chaco) is about 515,150 square miles; its population numbers some 3,000,000, one half of which are pure native Indians, one quarter half-castes. The area of Paraguay is about 98,000 square miles; less than half of this is styled "civilized territory." Its population is estimated at 1,000,000; the composition of the latter is uncertain but is probably analogous to that of Bolivia.

YUGOSLAVIA THE COUP D'ETAT

EVER since the creation of Greater Yugoslavia by the Peace Treaties of 1919, internal political troubles have distracted the newly constituted State. Their cause may be traced back to the position of the Serbs of old Serbia in the Triune Kingdom. This situation has already been explained in the JOURNAL.¹

The Serbs proper form but a minority, approximately 25 per cent., of the total population of 12,000,000 inhabiting modern Yugoslavia. But in spite of that fact they have succeeded in keeping the entire higher administration of the State in their own hands, while dominating the corps of officers and monopolizing all the higher ranks of the army. In so doing they have totally alienated their Croatian and Slovene fellow subjects. The latter, having grown accustomed to the gentler and more Western methods of Hapsburg government, have never become reconciled to the so-called "Serbification" of the new State by methods stigmatized by themselves as Oriental, if no worse.

Until 1925 the disputes between Serbs, Croats and Slovenes raged unchecked in Parliament. Only the adroitness of Pashich, the then Prime Minister, averted a civil war. After Pashich's death, in 1926, things went from bad to worse. The Government at first attempted to rule without a Parliament, but failed miserably. A new Parliament was convened, but the Croat opposition continued clamouring for autonomy.

King Alexander then tried conciliation and turned to Radich, the Croatian leader, to form a government, but met with a rebuff. Following on this incident a new Yugoslav Government was called upon to ratify the Nettuno Treaties of Commerce concluded with Italy in July, 1925.² The Croatians bitterly opposed this measure, and anti-Italian rioting ensued. Finally, on 20th June, 1928, in the course of a violent scene in Parliament, shots were exchanged; two deputies were killed and three wounded, among these being Radich. The opposition then withdrew to Agram to set up as a Croatian National Assembly. The King, in despair, thereupon turned to Koroschetz, the Slovene leader, to form a ministry. Radich died in August and became a national martyr in Croatia. In the absence of the opposition the Nettuno Treaties were ratified, and more rioting took place. Then Koroschetz, after making an honest effort to conciliate all parties, finally resigned on 30th December.

¹ See "The Macedonian Problem," page 151, JOURNAL of the R.U.S.I. February, 1928.

² These Treaties consist of some two hundred articles, all of minor import, only a fraction of which are objectionable to the Croats.

This led to the King's coup d'état. He dissolved Parliament, suspended the constitution, prohibited all political gatherings, and enforced a strict censorship. He now claims all legislative power, and intends to govern solely through a coalition cabinet which has been formed under General Sivkovich,¹ the present Commander of the Guards Division, as Prime Minister and Minister for the Interior, with a composite ministry mainly pro-Serb in character.

At first the King's action gave some satisfaction, for it had been imagined that Parliament itself barred the way to the realisation of Croatian aspirations. But there has been some revulsion of feeling. It remains to be seen whether the Royal Dictatorship can subsist, or whether a collection of nationalities that have in the past been notoriously quick to take up arms in times of political upheaval, will submit to a military autocracy exercised principally through the old Serb personnel of the Army.

PERSIA

OPERATIONS AGAINST DOST MOHAMED.—For many months the Persian Government have been laboriously concentrating a mixed force of all arms in the Persian Sarhad, with the object of bringing to book the local Governor of Persian Baluchistan, Dost Mohamed, Khan of Bampur. This chief seems to have abused the confidence of the Shah by establishing himself in a position of virtual independence in his own province.

After formal negotiations, coupled with the threat of an impending advance, had failed to produce any alteration in his attitude, orders were issued from Teheran in September, depriving Dost Mohamed of his Governorship and declaring him to be a rebel. Meanwhile, arrangements for the advance of a Persian force, numbering, with lines of communication troops, some 5,000 men, had been perfected, and active operations commenced towards the end of November. By concentrating such an imposing army the Persian Government were leaving little to chance and, in the event, their caution proved to be justified. Despite truculent manifestoes issued by Dost Mohamed, both Bampur and Fahruj were occupied by Government troops and Dost Mohamed was obliged to retreat to Sarbaz with the remnants of his tribal force. In the circumstances it is not anticipated that there will be any further serious resistance.

¹ Sivkovich enjoys a sinister reputation in Belgrade, having been implicated in the murder of King Alexander I and Queen Draga, and suspected of complicity in the Sarajevo crime of 1914.

AFGHAN AFFAIRS

EVER since the return to Afghanistan of King Amanullah, after his prolonged Western tour, the persistent attempts made by him to introduce occidental methods of life and of government into his own country had been arousing resentment and discontent among his subjects. Amanullah had clearly been fired with a deep desire to emulate the results achieved by Mustapha Kemel Pasha in Turkey with regard to "westernizing" that nation. In particular the King's order that the Afghan elders coming to Kabul on state or administrative duties should wear purely western dress, aroused great opposition. But Afghanistan is not Turkey; so Amanullah failed in his attempts.

Discontent developed into rebellion, and during November, outrages were perpetrated by the Shinwaris of Eastern Afghanistan. The King took the field against them but effected little and made a truce with the rebels on 12th December, but this was not kept and the rebels marched on Kabul. The situation then grew worse and the Government of India, a few days before Christmas, began to take measures to evacuate European women and children of all nationalities from Kabul by air to Peshawar.

On 21st December more fighting took place, this time outside Kabul, in the course of which the British Legation was used as cover by either side. As a result it was damaged by rifle bullets and shell. All the women and children were therefore evacuated and this was completed by 3rd January.

King Amanullah, feeling his insecurity, then began to make concessions and to rescind his westernizing policy. A Council of Sirdars and Mullahs¹ was set up for the purpose of overhauling recent legislation with the object of bringing it into consonance with the Koran. The emancipation of women was to cease. The Afghan children sent to Turkey for education were to be recalled. But these measures came too late. Disloyalty spread so far that on 14th January Amanullah abdicated in favour of his elder half-brother, Inayatullah. Four days later the insurrection assumed a fresh complexion. The leader of the movement, Bacha-i-Saquo, an obscure brigand by origin, declared himself Ameer (not King) under the title of Habibullah. Inayatullah thereupon fled from Kabul, being taken to Peshawar, with his family, in a British aeroplane. He was conveyed thence to Quetta by special train. From Quetta he rejoined his brother at Kandahar.

The former King Amanullah next declared that he had abdicated only in favour of Inayatullah, and now consequently rescinded his act

¹ Note—This in mediaeval parlance might be translated as a Council of Barons and Bishops.

of abdication. He is said to be concentrating troops at Ghazni and Kandahar with a view to marching upon Kabul to oust the usurper, Habibullah.

The situation remains somewhat obscure. So far the fighting has not been severe, and casualties have remained trivial. It would be difficult to say what the outcome of any operations on the part of Amanullah might be. It is open to doubt whether Habibullah commands any really large following throughout the country. On the other hand, of Amanullah's recent unpopularity there can be no question.

It is improbable that matters will really come to a head until the year has advanced sufficiently for weather conditions to make renewed hostilities possible.

CHINA

MOHAMMEDANISM IN CHINA.—It is estimated by some authorities that Mohammedanism is the religion of from fifteen to twenty millions of people in China—others place the number as low as between five and ten millions. Mohammedans are found mainly in Chinese Turkestan, Kansu, Shensi and Yunnan.

China was constantly affected by the movements and triumphant advance of Mohammedan armies in Central Asia but Mohammedan troops first entered China in A.D. 757; they came in response to an appeal to the Caliph by the T'ang Emperor Su Tsung for forces to help him against rebel Chinese. These soldiers, whose number is uncertain, remained in China and married Chinese wives; they are supposed to be the nucleus of the present Mohammedan body. Mohammedanism also came with trade to parts of South China; and the wise rule of a Mohammedan appointed to administer the Province of Yunnan (according to Marco Polo) converted the natives to "the faith."

During the last two centuries there have been several serious Mohammedan rebellions—these were not, however, regarded as religious wars. Minor risings occurred in 1818, 1826, 1834, but the most serious broke out in 1855 and lasted for eighteen years. This rebellion was in Yunnan. A rebellion in Kansu and Shensi, which broke out in 1862 was not quelled until 1870. During this rebellion the population of Kansu is said to have been reduced from fifteen millions to one million. Trouble spread from Kansu into Sinkiang where the notorious Yakoob Beg established himself in Kashgaria (south-west Sinkiang). He formed an independent state which he ruled for twelve years. Yakoob rigidly enforced the laws of the Koran. His power was crushed in 1877 by a famous Chinese

General Tso Tsung-T'ang, who recovered the lost territory and stopped the threatened spread of Mohammedanism to the rest of China.

Any increase in the number of Mohammedans in China is principally due to the birth rate and not to proselytisation. The followers of Islam hold tenaciously to their religion in its external sense. As the Koran may not be translated and as they insist on circumcision and abstinence from pork, the religion is not very attractive to the Chinese.

JAPANESE RAILWAYS IN KOREA

With the completion of the railway lines from Gensan to the frontier garrison town of Kainei in Korea, and from Kirin to Tunghua in Manchuria, in the autumn, Japan stands within an ace of being provided with means for rushing large bodies of troops and war material into Manchuria, if ever she requires to do so, with far greater rapidity and less risk than is possible at the present time.

As things are at present, she has only two lines of approach—one via Port Arthur and Dairen, the other by Fusan and Antung. With the completion of the line to Kainei, and from Kirin to Tunghua, however, it only remains to link Kainei and Tunghua by rail—a distance of little more than a hundred miles—to provide the third and best approach of all. Not only will the distance be shortened thereby, but safety in transit across the intervening seas will be greatly increased, as the Sea of Japan is virtually a Japanese lake and is easily protected, whereas the passage to Dairen, and even to Fusan, is much more open to attack.

CORRESPONDENCE

MECHANIZED TRANSPORT IN SMALL WARS.

TO THE EDITOR OF THE R.U.S.I. JOURNAL.

SIR,—In a review of my article published under the above heading in your JOURNAL of August, 1928, the "Journal of the Indian Army Service Corps" for October, 1928, commented on my eulogizing the Burmese drivers amongst the Asiatics employed in Mesopotamia, pointing out that the first batch of Burmese were volunteers from a big college, and were therefore of a better education than those that followed later.

My remarks regarding the Burmese referred to the 800 drivers of 1023 and 1024 Companies which were mobilized in India. The former unit was engaged in the operations in Khan, Baghdadi, Hillah, Persia and Mosul, and the latter in Persia.

Colonel F. W. Leland, C.B.E., D.S.O., in his book "With the M.T. in Mesopotamia," refers to the Burmese driver as being quicker in picking up driving and the care of the car than any of the other Indians employed in that theatre. This was, he says, all the more surprising in view of the fact that the Burmese when at home is particularly lazy. He adds that the Burmese seemed to be contented with his lot, however hard it might be.

Yours, etc.,

Catterick Camp,

10th January, 1929.

G. C. G. BLUNT, Lt.-Col.,
R.A.S.C.

Note.—Lieut.-Colonel Blunt's letter refers to the following paragraph of the "Indian Army Service Journal" for October, 1928:—"Lieut.-Colonel Blunt's article on mechanized transport in small wars is worth very careful study: one small error was detected in his description of Asiatic drivers, when he eulogizes the Burmese; it was not generally recognized that the first batch of Burmese sent to Mesopotamia were volunteers from a big college, their knowledge of English and general education led to a demand for more Burmese; these were recruited, trained and despatched, but unhappily they represented the real Burman recruit, and were soon returned to India for discharge. Another point which he has not brought out is the difficulty caused by an instructional staff having no knowledge of the language spoken by the men under him."—EDITOR.

AN EPISODE OF THE GERMAN OFFENSIVE OF 1918

TO THE EDITOR OF THE R.U.S.I. JOURNAL.

SIR,—Would you permit me to point out an apparent error in the very useful note you have appended to my article which you published under the above title in your November issue?

I think the 4th line should read: "50th Division and a Brigade of the 55th, and were already preparing to move off."

It was the Portuguese who were preparing to move off on relief: the Brigade

of the 55th was not preparing to move. It would have relieved a part of the Portuguese front on the night 9th/10th April.

Yours, etc.,

H. S. JEUDWINE,

Lieut.-General.

(The error which General Jeudwine kindly points out was due to a misprint.—EDITOR).

THE AERIAL DEFENCE OF CITIES.

TO THE EDITOR OF THE R.U.S.I. JOURNAL.

SIR,—In Major Turner's article entitled as above, the following statement appears: "Cities more distant than London were bombed during the Great War, but by airships, not aeroplanes; and it is safe to say that airships will not be used for such a purpose in this part of the world again."

Now, on the author's own showing, the only countries within bombing range of England, by aeroplane, are France, Germany, Belgium and Denmark. But the recent flight of the "Graf Zeppelin" to America has proved that New York lies within bombing range of Germany, the airship having arrived with enough fuel to bring her home again in normal weather conditions, i.e., with a 20 mile an hour wind in her favour. The new airships building in the United States, being larger than any British or German ship, should be able to reach any part of the world. Major Turner makes the mistake of thinking that the sun has set on airships, as a weapon, for ever. But no sun sets for ever, it goes full circle, and another day dawns. Our particular sun is about to rise and disclose airships, immune to incendiary attack, capable of carrying large loads to any part of the world, there lying for days outside aeroplane range, and then attacking when weather conditions suit them, and hamper the defence. In the thick clouds or fog, and navigating by W/T, such airships will be hard to stop. Even on short distance raids of 300 miles it might probably be better to send over one such airship with 50 tons of bombs, using aeroplanes to clear the way for her, than to carry smaller loads in aeroplanes themselves.

In the past our airships have never co-operated with our sea-going fleets, our Army or our Air Force. Our new airships, if properly controlled and handled, should shortly be able to demonstrate how useful they might be to all three Arms, and so prove or disprove Major Turner's opinion regarding their offensive qualities.

Yours, etc.,

F. L. M. BOOTHBY,

Capt., R.N.(Retd.)

A BATTLESHIP ADVENTURE.

TO THE EDITOR OF THE R.U.S.I. JOURNAL.

SIR,—In a recent number you published an article from a Naval Officer in which he described his adventures in taking a Japanese warship from England to Japan. He concluded by stating that there is probably no precedent for a voyage of this kind.

As a matter of fact, there is a precedent, and one which may be of sufficient general interest to permit of your printing a short description. I am unfortunately not able at the moment to refer to my father's log to verify dates, etc., but the following statement is substantially accurate:

In, or about, 1880, the first Japanese ironclad, the "Hi Yei," was built in England—by Messrs. Vickers, I think. As she was to be handed over in Japan, two naval officers, Captain Blackburne and Commander Dundas (my father), were invited to take her out. They took her over manned by a heterogeneous crew of many nationalities. The first question which arose was as to the flag under which she was to sail. The Admiralty naturally declined to allow the use of the White Ensign, the Japanese Government refused the use of the Japanese Ensign, as she had not been taken over, while the Board of Trade vetoed the use of the Red Ensign, as she was not of British Registry. Eventually, after a good deal of delay, she sailed under no flag—or as my father said, under the Jolly Roger. As a result, the crew, though signed on for the voyage, was legally subject to neither naval nor merchant service rules of discipline, and many strange methods had to be adopted by the ship's officers to maintain order. At Malta the crew deserted, more or less wholesale, and had to be shepherded back on board at the point of the officers' revolvers.

The ship carried no doctor and my father had with him only castor oil and opium, which he dispensed jointly or severally, as the spirit moved him, as a panacea for all ills, external and internal.

She carried a number of Japanese cadets and ratings, who had been undergoing training in England. Amongst these was Cadet Togo, later to become famous as the Admiral Commanding-in-Chief in the Russo-Japanese war.

As English signatures were not understood by the Japanese, a seal was made bearing the name of the ship in Japanese characters, and this was used as a substitute on documents. This seal is still in my possession.

After a somewhat adventurous voyage, not unlike that recently described in the JOURNAL, the "Hi Yei" arrived off the Japanese port whither she was bound. She was there boarded by a number of Japanese naval officers and engineers, who wished to see her brought into port.

On entering the bay, the order was given from the bridge "slow." As this met with no response, "stop"—"slow astern"—"full astern"—were ordered in quick succession, and the helm put hard over as the ship was by now charging round the bay through a throng of craft of all sizes. As the engineroom still made no response, my father fled below himself, expecting to find that mutiny had broken out. He, however, found the Scottish Chief Engineer and all his satellites tearing round the engineroom in hot pursuit of the Japanese who were bent on turning on every valve and tap, regardless of consequences. When reproached for not obeying orders, the old Chief Engineer merely remarked: "How could any man dae onything wi' yon yella devils around. It's better to gang ashore at full speed than to hell wi' a burst boiler."

Eventually the ship was brought safely to anchor, the crew discharged and the ship handed over to the Japanese Naval Authorities, by whom the British Naval Officers were most hospitably entertained.

Yours, etc.,

J. C. DUNDAS, Lieut.-Colonel,
Royal Tank Corps.

Note.—This letter refers to an article entitled: "A Battleship Adventure." The Voyage of the 'Kasuga,' by Lieut.-Commander H. H. Paynter, R.N., which appeared in the JOURNAL for February, 1928.—EDITOR.

GENERAL SERVICE NOTES

IMPERIAL DEFENCE COLLEGE.

NEW COMMANDANT.—Major-General W. H. Bartholomew, C.B., C.M.G., D.S.O., *p.s.c.*, succeeded Vice-Admiral Sir Herbert W. Richmond, K.C.B., as Commandant of the Imperial Defence College on 1st January.

THIRD COURSE.—The following were appointed as students for the Third Course which commenced on 14th January :—

Navy.

Captain T. F. P. Calvert, D.S.O., R.N.
Captain A. B. Cunningham, D.S.O., R.N.
Commander V. H. Danckwerts, R.N.
Captain J. W. S. Dorling, R.N.
Captain J. G. P. Vivian, R.N.

Army.

Brevet Lieut.-Colonel A. P. Y. Langhorne, D.S.O., M.C., R.A.
Brevet Lieut.-Colonel W. G. Lindsell, D.S.O., O.B.E., M.C., R.A.
Brevet Lieut.-Colonel B. C. T. Paget, D.S.O., M.C., The Oxfordshire and Buckinghamshire Light Infantry.
Brevet Lieut.-Colonel T. S. Riddell-Webster, D.S.O., The Cameronians.
Brevet Lieut.-Colonel H. J. Simson, M.C., The Royal Scots.

Royal Air Force.

Squadron Leader C. J. Mackay, M.C., D.F.C.
Squadron Leader C. E. H. Medhurst, O.B.E., M.C.
Wing Commander C. F. A. Portal, D.S.O., M.C.
Wing Commander C. W. H. Pulford, O.B.E., A.F.C.
Wing Commander J. C. Quinnell, D.F.C.

India.

Brevet Lieut.-Colonel A. B. Haig, M.C., I.A.
Brevet Colonel H. E. Weekes, O.B.E., I.A.

Canada.

Lieut. Commander G. C. Jones, R.C.N.

Civil Service.

Mr. R. I. Baird, Second Secretary, Foreign Office.
Mr. L. G. Duke, Principal, Board of Education.
Mr. G. S. Owen, Principal, Ministry of Labour.

GERMANY.**GERMAN DEFENCE POLICY.**

The voting of credits by the German Reichstag for the construction of the first of the four 10,000 ton armoured ships of the new programme was the occasion selected by General Groener, the Minister for Defence, for the circulation to the political party leaders in Parliament of a memorandum dealing with German defence policy.

Although clearly intended for political consumption and designed to further the granting of the credits, and also, perhaps, to act as a spur to German anti-Polish sentiment, the document is not without interest.¹

It begins by considering four points :—

- (a) The possibilities of Germany being engaged in war.
- (b) The task of the German Navy in such a case.
- (c) } The technical and service reasons for constructing these four ships.
- (d) }

The drift of the argument contained under these headings is the following. Germany is incapable of waging a great war owing to her present state of disarmament. Still, such forces as she may keep up under the Treaty of Versailles must be sufficient to make any would-be aggressor pause before attacking her. These German forces must "constitute a risk," in itself an important factor.

Two practical cases must be considered :—

- (1) Germany has to be ready to resist "territorial robbery." Starting from this hypothesis, the Minister argues that Poland will sooner or later be meditating an attack against Germany for reasons of territorial aggrandisement. Germany must be ready to meet this threat.
- (2) Germany has to be capable of protecting her neutrality and her interests in a great war. The state of Europe, it is pointed out, is such as to render another war probable; and the stronger Germany is, the better will she "be able to realise" these tasks.

The memorandum then proceeds to show that in Case 1, Germany requires these ships for the purpose of supporting from the sea the necessary movement of German forces into East Prussia, i.e., across the Polish Corridor, for the defence of that Province against Polish aggression. In Case 2, the arguments adduced are too obvious to need repetition. But it is worth noting that British approval is claimed for Germany's aspiration to hold the Baltic Sea against possible Russian attack.

The remaining arguments contained in the memorandum are based on the uselessness of the existing German battleships, the necessity for training men on modern vessels, the expense of maintaining obsolete ships, the hopeless task of modernising them, and the necessity for the provision of work in the national shipbuilding yards. Lastly, there is brought in the moral atmosphere to be created by the possession and use of efficient war material. Incidentally, it is claimed that the building of this squadron of four ships would give Germany a naval superiority over Russia in the Baltic.

¹ The memorandum was published in full by the "Review of Reviews" in its issue for 15th January, 1929, pages 16-19.

JAPAN.

AIR DEFENCE EXERCISE, 1928.

The authorities, realising the importance of rousing the general public from their apathy, staged an aerial "bombardment" of Osaka, the great commercial and industrial centre of Japan, in July, 1928, with the object of demonstrating the dangers to be anticipated if ever Japan were subjected to an air raid in her present state of unpreparedness with regard to matters relating to aerial defence.

In order to create the necessary "atmosphere," everything possible was done to approximate war conditions. A.A. guns, searchlights, and audiphones were set up; the civilian population was instructed what to do and how to do it during the "bombardment"; all lights in the city were put out and those on trains, trams, motor cars and the like were dimmed; anti-gas and anti-fire measures were taken; first-aid posts and gas-proof shelters were erected; firemen, policemen, municipal authorities and the public in general were given definite parts to play. Everyone responded admirably.

The authorities professed to be well satisfied with the experiment; but, although they undoubtedly hoped that the temporary interest thus aroused in the matter of aerial defence would help to ensure the passage of the estimates for their long cherished scheme to increase the defences of the country against aerial attack, it was noticeable that the appropriations demanded a few months later by the War Office for new enterprises (which included appropriations for aerial defence) were cut down by the Cabinet from Y47,000,000 to only Y10,000,000.

About Y5,500,000 of this will be set aside for a three-year programme of aerial defence, but the total sum to cover the cost of the defence scheme planned by the General Staff is said to be Y50,000,000. The points to which special attention is to be paid are, according to press reports, the protection of the area around Tokyo and Yokohama, the industrial district of Nagoya and its vicinity, the commercial and industrial districts of western Japan, including Osaka and Kobe, part of northern Kyushu, including the government steel works and the Kokura arsenal, and the oilfields of Niigata prefecture in the north-west coast district of Japan.

THE ROYAL TOURNAMENT, 1929.

The Royal Tournament for 1929 will be held at Olympia, Kensington, from Thursday 23rd May to Saturday, 8th June, 1929, inclusive.

NAVY NOTES

GREAT BRITAIN.

H.R.H. THE PRINCE OF WALES.

On receipt of news of the serious illness of the King, the Prince of Wales, who was at a camp in the Kondoa Irangi district, Tanganyika, decided, on 26th November, to return home immediately. He arrived at Dodoma next day and at Dar-es-Salaam on the evening of 28th November. There he awaited the arrival of H.M.S. "Enterprise," Captain H. D. Pridham-Wippell, which was ordered back from Aden when on her way home to England. Leaving Aden on 27th November, the cruiser reached Dar-es-Salaam on 2nd December, and left again with the Prince the same day. She was back at Aden on the 5th, and left again the same day for Suez.

It had been arranged that the Prince might leave the vessel here and proceed by train to Alexandria, to join H.M.S. "Frobisher," but His Royal Highness preferred to remain in the "Enterprise," which called at Suez on the 7th and at Port Said on the 8th. Brindisi was reached on the 10th, where the Prince boarded a special train for Boulogne, which was reached at 6.40 p.m. on 11th December. The destroyer "Torch" had been sent to await him there, but he was in time to catch the mail steamer "Biarritz," which left at 7.10 for Folkestone.

The Prince on 1st January received Captain Pridham-Wippell and conveyed his appreciation of the seamanship that enabled him to make so quick a journey home; in spite of adverse conditions of wind and current, the heat of the Red Sea, and a gale in the Mediterranean, the cruiser was kept at her best speed. The Admiralty directed that three days' additional leave should be granted to her crew.

H.R.H. Prince George, who had been serving in the cruiser "Durban," on the American and West Indies Station since August, also returned home. He was landed from his ship at New York on 14th December, and made the voyage to England in the "Berengaria."

FLAG APPOINTMENTS.

COMMANDER-IN-CHIEF, PORTSMOUTH.—On 24th November, the Admiralty announced that Admiral Sir Roger J. B. Keyes, Bt., K.C.B., K.C.V.O., C.M.G., D.S.O., LL.D., D.C.L., is to be Commander-in-Chief, Portsmouth Station, in succession to Admiral Sir Osmond de B. Brock, K.C.B., K.C.M.G., K.C.V.O., to date 29th April, 1929.

SECOND-IN-COMMAND, MEDITERRANEAN.—Vice-Admiral W. A. Howard Kelly, C.B., C.M.G., M.V.O., is to be Vice-Admiral Commanding the First Battle Squadron, and Second-in-Command of the Mediterranean Fleet, in succession to Vice-Admiral John D. Kelly, C.B., to date 26th April. He will assume command about 20th May. The "Revenge" will at the same time succeed the "Barham" as flagship.

BATTLE-CRUISER SQUADRON.—Rear-Admiral A. D. P. R. Pound, C.B., is to be Rear-Admiral Commanding Battle-Cruiser Squadron, in succession to Rear-Admiral F. C. Dreyer, C.B., C.B.E., to date 21st May. The "Renown" is to become flagship about the same time, on the "Hood" being taken in hand for refit.

FIRST BATTLE SQUADRON.—Rear-Admiral the Hon. R. A. R. Plunkett-Ernle-Drax, C.B., D.S.O., is to be Rear-Admiral, First Battle Squadron, in succession to Rear-Admiral W. M. Kerr, C.B.E., to date 12th April. He will assume command about 6th May.

REAR-ADMIRAL, GIBRALTAR.—Rear-Admiral Berwick Curtis, C.B., C.M.G., D.S.O., is to be Rear-Admiral in Charge and Admiral-Superintendent, Gibraltar, in succession to Rear-Admiral C. S. Townsend, C.B., to date 22nd March. He will assume command about 16th April.

ASSISTANT CHIEF OF THE NAVAL STAFF.—Rear-Admiral Wilfred Tomkinson, C.B., M.V.O., is to be Assistant Chief of the Naval Staff, in succession to Rear-Admiral A. D. P. R. Pound, C.B., to date 22nd April. Rear-Admiral Tomkinson will be appointed to "President," for duty inside Admiralty, from 25th March.

THIRD BATTLE SQUADRON.—Rear-Admiral H. K. Kitson is to be Rear-Admiral Commanding Third Battle Squadron, Atlantic Fleet, in succession to Rear-Admiral J. M. Casement, C.B., to date 6th May. The "Emperor of India" is to become flagship of this Squadron when the "Benbow" pays off for refit.

SECOND CRUISER SQUADRON.—Rear-Admiral the Hon. M. R. Best, C.B., D.S.O., M.V.O., is to be Rear-Admiral Commanding Second Cruiser Squadron, in succession to Rear-Admiral Frank Larken, C.B., C.M.G., to date 16th May.

AUSTRALIAN NAVY.—The appointment of a new Rear-Admiral to the Royal Australian Navy is referred to under "DOMINION NAVIES."

REORGANIZATION OF THE NAVAL STAFF.

It was announced in Admiralty Fleet Orders on 28th December, that the following changes in the peace organization of the Naval Staff at the Admiralty had been approved, and would be carried out by 1st January, 1929: Instead of seven Divisions and two Sections, there will be six Divisions, as follows:—

Naval Intelligence Division (N.I.D.) as before.

Plans Division (P.D.), combining the Plans and Trade Divisions.

Operations Division (O.D.), as before.

Training and Staff Duties Division (T.S.D.), combining the Training and Staff Duties and Gunnery Divisions.

Tactical Division (T.D.), combining the Torpedo Division and Tactical Section.

Naval Air Division (N.A.D.), in place of the Naval Air Section.

When the Naval Staff was constituted in 1912, and until the outbreak of the war, there were only three Divisions; these were concerned with Intelligence, Operations and Mobilization. As a result of war development, the Mobilization Division became a separate Department outside the Naval Staff, and so it continues. The rest of the Staff was divided into eleven Divisions, of which those concerned with Trade, Signals, Anti-Submarine duties, Minesweeping and Mercantile Movements have been abolished or merged into other Divisions since the war.

The re-arrangement now made is purely a matter of Admiralty organization and enables further economy in clerical work to be made. The official return of staffs in Government Departments shows that the total of persons employed in Admiralty establishments has been reduced by 1,370 since April, 1922.

PERSONNEL.

HONORARY PHYSICIANS AND SURGEONS TO THE KING.—Revised regulations governing the appointment of Honorary Physicians and Honorary Surgeons to the King, which had been approved by His Majesty, were announced in Fleet Orders, on 30th November. Medical officers appointed as such, in future, are to relinquish their honorary appointments on retirement from the Service. Officers on the retired list at present holding the appointments are to continue to hold them. The officer holding the position of Medical Director-General of the Royal Navy is to receive, *ex officio*, an appointment as Honorary Physician or Honorary Surgeon to the King.

The total number of Honorary Physicians or Honorary Surgeons to the King is to remain at eight, excluding extra or supernumerary appointments, but the number of appointments as Honorary Physician or Honorary Surgeon is to be varied at discretion within the total, instead of four of each being allowed as hitherto. Officers, in order to be eligible for appointment, are to be of the rank of Surgeon-Captain or above. In accordance with this Order in Council, it was announced on 25th January that Surgeon Vice-Admiral Arthur Gaskell, C.B., O.B.E., Medical Director-General of the Navy, had been appointed an Honorary Surgeon to the King, as from 1st November, 1928.

H.M.S. "IMPREGNABLE" CLOSED DOWN.—The last boys from the "Impregnable" were drafted to sea on 1st January, 1929, and the ship closed down as a training establishment from that date.

RECRUITING STOPPED.—Recruiting for all branches, including boys, was suspended on Monday, 28th January, the numbers borne being up to the maximum sanctioned for the year in the Navy Estimates.

"NAVY WEEKS" TO CONTINUE.—The Admiralty have approved of the "Navy Weeks," started at Portsmouth in 1927, and extended to the other two ports in 1928, being continued as an annual institution. The admissions to the Dockyards in 1928 were 198,348, and the proceeds £11,355 2s., the distribution of which among naval charities was explained in A.F.O. 45/29.

JACKSON-EVERETT PRIZE.—Lieutenant J. P. L. Reid, of H.M.S. "Hood," has been awarded the Jackson-Everett Prize for 1928, for passing the best examinations in the qualifying course for signal officers. Lieutenant Reid, who entered Osborne College in September, 1916, passed out first in his term, winning the grand aggregate, the Robert Roxburgh prize and four other prizes; and in passing for Lieutenant he took first-class certificates in all subjects and won the Beaufort Testimonial and the Wharton Testimonial with gold medal.

JULIAN CORBETT PRIZE IN NAVAL HISTORY.—In memory of the late Sir Julian Corbett, Editor of the Official Naval History of the War, who died in 1922, a new Prize has been instituted in Modern Naval History. At present of the value of £50, it will be awarded by the Senate of the University of London, on the recommendation of the Institute of Historical Research Committee for work based on original (MS. or printed) materials for modern naval history. Details of the Julian Corbett Prize, as it will be known, are contained in A.F.O. 3031/28.

ACCELERATED PROMOTION MODIFIED.—An Order of 7th December, notified the discontinuance of the arrangement laid down in Appendix XII, part 13, King's Regulations and Admiralty Instructions, whereby commissioned officers from warrant rank in certain branches might qualify for earlier promotion to the rank of Lieutenant by selection, subject to passing certain examinations, in so far as it relates to the Signal Boatswain and Warrant Shipwright branches. The number of Signal Lieutenants and Shipwright Lieutenants and above will be maintained at a figure not exceeding 8 per cent. of the total number of officers in each branch, and promotion will be made for long and zealous service. By the new order, only the Gunner, Boatswain, Engineer and Mechanician branches of warrant officers remain eligible for accelerated promotion. In reference to the change, the *Naval Warrant Officers' Journal* for January said: "We are of opinion that very few tears would be shed if the scheme as regards the remaining branches was dropped altogether. It has never proved of much inducement, judging by the few who have taken advantage of the opportunity."

OFFICERS' OUTFIT ALLOWANCE.—Outfit allowance is normally paid to the officer himself, on application by him when it becomes due. A new Fleet Order directs that the grant for Sub-lieutenants of all categories and probationary Lieutenants, R.M. (direct entry) may, at Admiralty discretion, be paid to the officer's parent or guardian, if a claim is lodged before payment has been made to the officer, subject to a written undertaking being given to refund the amount in whole or in part, in accordance with the provisions of King's Regulations and Admiralty Instructions, article 1582, clause 6.

SALUTES.—Attention is directed to the amendment of articles 153 and 154, King's Regulations and Admiralty Instructions, in K.R., 11/28. The effect of these amendments is to make it compulsory for officers, chief petty officers, petty officers and leading rates, if wearing head-dress, to salute both on board and on shore whenever the National Anthem or any foreign National Anthem is played, and on board when Colours are hoisted and when they are lowered at sunset.

MATERIAL.

THE "LONDON" CLASS.—H.M.S. "London" commissioned at Portsmouth on 5th February, under Captain H. H. Rogers, M.V.O., O.B.E., with a full crew, for service as flagship, First Cruiser Squadron, in succession to the "Frobisher."

The second ship of the four in this group, H.M.S. "Devonshire," Captain H. C. Rawlings, D.S.O., commissioned for trials at Devonport on 1st January. She is due for completion on 25th March. The "Sussex," Captain R. H. T. Raikes, D.S.O., is due for completion in March. These two cruisers and the "Shropshire," which is due for completion in September, will also join the First Cruiser Squadron.

LAUNCH OF THE "NORFOLK."—The cruiser "Norfolk" the second of the three cruisers of the 1926 programme, the first being the "York," was launched at the yard of the Fairfield Company, Govan, on 12th December, the naming ceremony being performed by Lady Leicester, wife of the Lord Lieutenant of the County after which the ship is named.

LAUNCH OF THE "DORSETSHIRE."—The last of the 1926 cruisers was launched at Portsmouth on 29th January and named the "Dorsetshire" by the Countess of Shaftesbury, wife of the Lord Lieutenant for the County of Dorset. A contingent of fifty N.C.O.'s and men of The Dorsetshire Regiment attended by invitation from their depot at Dorchester.

LAUNCH OF THE "OLYMPUS."—The submarine "Olympus," the first of two of the 1926 programme, ordered from Messrs. Beardmore & Co., Ltd., Dalmuir, was launched there on 11th December, the naming ceremony being performed by Mrs. Backhouse, wife of the Third Sea Lord. The second vessel, and the last of six in the programme, is due to be launched on 26th February, and to be named the "Orpheus."

EXERCISES AND CRUISES.

ATLANTIC FLEET.—The Atlantic Fleet left Portland on its last cruise under the command of Admiral the Hon. Sir Hubert Brand, on 15th January. It is based on Gibraltar until 2nd April, as in other years since the war. Visits are being made to Arosa Bay, Tarragona, Barcelona, Huelva, Cadiz, Port Mahon, Oran, Casablanca, Palma (Majorca) and Malaga. Combined exercises with the Mediterranean Fleet are due to be held between 13th and 23rd March, off Pollensa Bay. An outline programme for the year shows that the summer cruise of the Fleet will begin on 1st May and last until 22nd July. The autumn cruise is to begin on 4th September.

MEDITERRANEAN FLEET.—The Mediterranean Fleet left Malta on 15th January for independent cruises until 1st February. The flagship of Admiral Sir Fredeick Field, the "Queen Elizabeth," went to Corfu; the "Barham," flagship of Vice-Admiral J. D. Kelly, to Alexandria; the rest of the First Battle Squadron, with the Second Destroyer Flotilla, to Athens; the "Frobisher" and "Danæ" to Cattaro; the Third Cruiser Squadron to Volo and neighbouring anchorages; the "Cairo" and First and Fourth Flotillas to Astakos, Dragomesti Bay; and the "Sandhurst" and Third Flotilla to Port Drepano. The "Eagle" and "Assistance" accompanied the main body of the Fleet to Athens.

AMERICA AND WEST INDIES.—The "Despatch," flagship of Vice-Admiral Sir Cyril Fuller, left Bermuda on 6th January for a cruise down to the Falklands and South Georgia. The "Caradoc" left on the same day for the Canal Zone and the coast of Chile, and the "Durban" for the West Indian Islands. The "Capetown" and "Colombo" were to visit Kingston, Jamaica, from 25th January to 18th February, and then cruise independently in the West Indies.

EAST INDIES.—After spending Christmas at Karachi, the "Effingham," flagship of Vice-Admiral B. S. Thesiger, left on 2nd January, for Bombay, Ratnigiri, Goa, Calicut, Androsth, Minicoy, Colombo, Madras and Trincomalee. The "Emerald" spent Christmas at Calcutta, and left on 7th January for Akyab, Rangoon, Port Blair and Trincomalee. The "Enterprise" was at home refitting and recommissioning.

THE FLEET AIR ARM

EMPLOYMENT OF CARRIERS.—The "Argus" and "Furious" left Portland on 15th January for the Atlantic Fleet spring cruise. The "Eagle" accompanied the First Battle Squadron of the Mediterranean Fleet on its visit to Athens during January, but the "Courageous" was taken in hand for repairs at Malta until 8th March. The "Hermes," China Station, visited Kudat and Manila in December. The "Pegasus" was paid off into the charge of a care-and-maintenance party at Devonport on 30th October, and taken into dockyard control on 6th November, for preparation for sale.

INTER-SERVICE EMPLOYMENT.—An amendment to the Order on this subject, published in the last issue of the JOURNAL (page 845), provides that when any ship

carrying an aircraft, the crew of which does not include a telegraphist air gunner, is about to commission, similar arrangements are to be made for a telegraphist to undergo a five-day course in aircraft radio telephony at the Royal Air Force Base, Gosport.

AIR OFFICERS IN NAVY LIST.—The procedure for showing Naval and Royal Marine officers attached to the Royal Air Force in the Navy List has been modified, beginning with the issue of the List for December. In the seniority lists, there is now shown in brackets after an officer's name his rank and seniority in the R.A.F., instead of the notification "Attached to R.A.F." This latter phrase is now inserted in the alphabetical list at the beginning of the volume.

NEW COURSES.—The next courses of *ab initio* flying instruction for Naval and Marine officers attached to the Royal Air Force for service with the Fleet Air Arm, will begin at the R.A.F. Training Base, Leuchars, on 13th May and 9th September.

ROYAL NAVAL RESERVE.

NEW A.D.C. TO THE KING.—The death, on 24th December, of Captain Maxwell B. Sayer, C.B.E., R.D., Captain-Superintendent of the "Worcester," caused a vacancy for a Royal Naval Reserve Aide-de-Camp to the King, which has been filled by the appointment of Captain Henry Stockwell, D.S.O., R.D., who has served in the R.N.R. since December, 1891, and commanded the armed yacht "Helga" in the Auxiliary Patrol during the war.

ROYAL NAVAL VOLUNTEER RESERVE.

SPRING CRUISE.—A number of R.N.V.R. officers and ratings embarked on the spring cruise of the Atlantic Fleet in January.

INTER-DIVISIONAL MINIATURE RIFLE SHOOTING COMPETITION.—The Ulster Division is to be congratulated on winning the R.N.V.R. Inter-Divisional Miniature Rifle Shooting Competition for the Sir Charles Walker Challenge Cup held during December, 1928. Their success is all the more remarkable in view of the fact that they returned the lowest score last year.

MERSEY DIVISION.—A party of 112 R.N.V.R. ratings under the Commanding Officer of H.M.S. "Irwell," took part in the Lord Mayor of Manchester's procession on the 18th November, 1928.

ULSTER DIVISION.—A Guard of Honour was provided by the Division on the occasion of the visit to Belfast of H.R.H. Princess Mary on the 13th October, last.

DOMINION NAVIES

ROYAL AUSTRALIAN NAVY.

NEW REAR-ADMIRAL.—On 11th January, it was officially announced that Rear-Admiral E. R. G. R. Evans, C.B., D.S.O., is to be Rear-Admiral Commanding the Royal Australian Navy, in succession to Rear-Admiral G. F. Hyde, C.V.O., C.B.E., R.A.N., to date 18th March.

NEW VESSELS.—H.M.A.S. "Canberra," Captain G. L. Massey, which left Portsmouth on 4th December on her voyage to Australia via the Cape was due at Sydney on 16th February.

The new submarines, "Otway" Commander A. G. Hine, D.S.O., and "Oxley," Lieut.-Commander F. E. Getting, left Malta, after their reconstruction in the Dockyard, on 15th November, for Australia, and arrived at Thursday Island on 23rd January, 1929.

ROYAL CANADIAN NAVY.

NEW DESTROYER CONTRACT.—Commodore Walter Hose, C.B.E., Chief of the Naval Staff, Canada, and Engineer Commander Thomas C. Phillips, R.C.N., arrived at Liverpool on 20th January, in connection with a contract for the building of two destroyers, at a cost of about £670,000, which has been placed with John I. Thornycroft & Co., Ltd. The vessels are stated to be 310 feet long, 29 feet wide, with a speed of 35 knots and a tonnage of 1,320. They are due for delivery in the spring of 1931. In the interval before the completion of these destroyers, Canada has the use on loan of the "Torbay" and "Toreador" from the Royal Navy, which have been renamed the "Champlain" and "Vancouver."

FOREIGN NAVIES

ARGENTINA.

NEW FLOTILLA LEADERS.—The flotilla leader "La Rioja," the last of three building by J. Samuel White and Co., Ltd., East Cowes, was launched on 26th January. The "Mendoza," the first of these flotilla leaders, ran her progressive trials on 23rd January, and the full power trial on 24th January, when the mean speed recorded during a six hours' continuous run in the English Channel was 38.24 knots, and the mean speed on the Admiralty measured distance 38.93 knots. The contract provides for a speed of 36 knots during a run of six hours duration.

TRAINING SHIP AT PORTSMOUTH.—On 20th November, Mr. Bridgeman, the First Lord, inspected the Argentine training ship, "Presidente Sarmiento," which was on a visit to Portsmouth by special invitation of the Admiralty. Captain G. J. Costa Palma and the officers and men of the training ship were entertained by the Admiral and the naval establishments at Portsmouth during their stay. On 16th November, seven officers and forty-six cadets from the ship visited Cowes to inspect the new Argentine destroyers building by Messrs. White & Co., Ltd.

BRAZIL.

NEW APPOINTMENT.—Rear-Admiral Alves Machado Silva has been appointed Commander-in-Chief of the Brazilian Navy.

SUBMARINE MISHAP.—On 28th November, a sudden rush of water into a submarine alongside the quay at the Ilha das Cobras, reaching the accumulators, created gas fumes which overcame seven of the crew.

CHILE.

LAUNCH OF THE "ALDEA."—The destroyer "Aldea," the last of six ordered from John I. Thornycroft & Co., Ltd., was launched on 29th November. The "Serrano," the first of the class, is nearly completed. The "Riquelme," the third in the series, is running her trials on the Clyde.

TWO SUBMARINES LAUNCHED.—The submarines, "Capitan Thompson" and "Almirante Simpson," the last of three building by Vickers-Armstrongs, Ltd., at Barrow, were launched on 15th January. Their general design is similar to that of the British "O" Class. The same firm have secured an order to build a submarine parent vessel.

VISIT TO GIBRALTAR.—The training ship "General Baquedano" arrived at Gibraltar on 29th November, on a three days' visit. In return for the exceptional friendship and hospitality shown to the cruiser "Despatch" on her recent visit to Chile, the local authorities made every effort to entertain the officers and cadets during their stay at the Rock.

FRANCE.

APPOINTMENT.—Rear-Admiral Nougat has been appointed in command of the Naval Squadron in the Far East.

NAVY ESTIMATES.—Passed by the Chamber on 6th December, the Navy Estimates provide for an expenditure of 2,430,000,000 f. (£19,440,000), excluding air services, now under the control of the new Air Ministry, and coast defence. For seven years in succession, the Estimates show an increase.

CONSTRUCTION PROGRAMME.—The programme of new construction for 1929, which came before the Chamber on 28th December, provides for the laying down in 1929, of one cruiser, six large destroyers, six submarines, one minelaying submarine, two despatch vessels and two oilers. Four coastal submarines are also to be asked for. In a New Year message, M. Leygues, the Minister of Marine, referred to the steady reconstruction of the Navy. On 1st January, 1927, there were twelve light units of the post-war programme in service; by 1st January, 1928, there were thirty-seven; and on 1st January, 1929, there were fifty.

NEW DESPATCH VESSELS.—The new despatch vessels in the above programme are to be of 2,000 tons, and specially designed with a view to the comfort of their crews in tropical climates. They will have a speed of 18 knots and an armament of two 5.5-in. and six 4-in. guns. Each will carry an aeroplane. The propelling machinery will consist of Diesel engines.

PERSONNEL IMPROVEMENTS.—M. Leygues also referred in this message to the steady increase during last year in recruiting, and to the raising of the pay of the ratings. The laws by which personnel is organized were simplified and brought up to date, and conditions of service and promotion improved. New ships had been thoroughly tested in long-distance cruises. Also during 1928, the First Squadron carried out manœuvres in the Mediterranean and the Bay of Biscay.

VOYAGES FOR CRUISERS.—The "Duchesne," the first of the French 10,000-ton cruisers, was ordered to leave Brest on 1st February, for a five-months' cruise round Africa, calling at ports in French West Africa, French Equatorial Africa, the Union of South Africa, Madagascar, the Comoro Islands and Zanzibar. The "Tourville," the second of these cruisers, is to leave in the spring for a world voyage, proceeding via Panama, the Marquesas and Society Islands, the New Hebrides, New Caledonia, New Zealand, Australia, Malaya, India and Egypt. The cruise will last about eight months.

GERMANY.

DEATH OF ADMIRAL SCHEER.—Admiral Reinhardt Scheer, who commanded the High Seas Fleet at the Battle of Jutland, died on 26th November, aged sixty-five.

He was born at Oberkirchen, the son of a professor at the local "gymnasium," and became a naval cadet in 1879. He specialised in torpedoes, and as captain, commanded the "Niobe," a destroyer flotilla, and the battleship "Elsass." In 1912 he became Chief of Staff in the High Seas Fleet, and when war broke out commanded the Second Squadron. He succeeded Admiral von Pohl as Commander-in-Chief in January, 1916, and in the autumn of 1918, became Chief of the Admiralty Staff, in succession to von Holtzendorff, being in this post at the Armistice. An English translation of his book, "Germany's High Sea Fleet in the World War," was published in 1920.

CRUISE OF THE "EMDEN."—The "Emden," the first of German post-war cruisers, is scheduled to visit Aden from 25th February to 1st March, Mombasa from 9th to 20th March, and Mahe, Seychelles, from 25th March to 5th April.

NEW ARMoured SHIPS.

GENERAL DESIGN.—Further details of this new class of warship have now been made public and indicate that they will be of very remarkable design. It is reported that the ships will be of comparatively great length and moderate beam in order to give high speed. Electric welding and light metals, said to be one third of the specific gravity of steel, will be extensively used, and it is anticipated that by this means a saving in weight of at least 500 tons will be effected. The total tonnage is not to exceed 10,000 in order to conform to the Versailles Treaty, but this will be estimated on the formula adopted by the Washington Agreement, which does not include fuel and stores.

ENGINES.—The vessels will be propelled by twin Diesel engines of exceptionally light design, developing 50,000 horse power. These are being made at Nuremberg. By way of comparison, it may be noted that the new engines weigh only 17½ lbs. per h.p., as compared with 55 lbs. per h.p. of submarine engines. The maximum speed will be 26 knots and a radius of action of 10,000 miles at 20 knots is provided for.

ARMAMENT.—The armament will consist of six 11 in. guns in two triple turrets, both of new and greatly improved design. In addition, there will be eight 6 in. guns, behind shields, and four 3.5 anti-aircraft guns. There will be six above-water torpedo tubes.

PROTECTION.—A complete belt and two armoured decks will run from end to end, the decks being specially designed to resist air attack. Under-water protection will be afforded by bulges and extensive water-tight sub-divisions.

The French paper *Le Yacht* expresses anxiety in regard to the effect that these four new warships will have on the balance of naval power. It points out that they will be more than a match for the post war 10,000 ton cruiser, and, while they could easily escape from the "Dreadnought" type of battleship, under favourable conditions they might even stand up to the latter.

GREECE.

BRITISH MISSION CONTRACT.—In November, the Greek Government obtained the consent of the British Government to the renewal of the contract for the British Naval Mission, which expires in March, but with changes in its composition. The present Mission, under Captain C. E. Tule, D.S.O., has given general satisfaction. It is advisory and instructional in character, and has no executive powers. There will be a few alterations in the composition of the Mission and these will take effect in May.

DESTROYER PROGRAMME.—According to the Athens Correspondent of the *Daily Telegraph*, writing on 20th November, 1928, the Greek Government has decided to order four ocean-going destroyers, similar to those built in England some years ago (the "Aetos" class, launched by Cammell, Laird, in 1911). Tenders will be invited shortly. This order will be in execution of a part of the naval programme laid down some time back.

ITALY.

NEW PROGRAMME.—It was officially announced on 25th January that the following additions are to be made to the Italian Navy :—Two 10,000-ton cruisers, two flotilla leaders of the "Condottiere" type, four destroyers and five submarines. The programme is to be begun in June next. It is in addition to the ships of the 1923-28 programme, and with them will give a strength of 14 cruisers, 16 flotilla leaders, 20 destroyers and 25 submarines of modern types in 1931.

NEW CRUISERS.—A second pair of 10,000-ton cruisers have been laid down in private yards at Trieste and Spezia, to be named, it is understood, the "Fiume" and the "Zara." The first pair, "Trento" and "Trieste," were completed during the past quarter, and taken to the dockyards at Spezia and Pola for trials.

Four other cruisers of lighter design, the "Alberto di Guissano" class, were laid down during 1928. These will be of 5,000 tons, 95,000 horse power, 37 knots. speed, and armed with eight 6-in. guns and eight 4-in. anti-aircraft guns. They are described as Italy's answer to modern submarine tactics. The speed is the highest claimed for any cruiser built or building.

JAPAN.

NAVAL REVIEW.—On 4th December, in bright but cold weather, the new Emperor of Japan reviewed his Fleet in honour of the Coronation. He embarked in the battle cruiser "Haruna," from which the ceremony was broadcast through the Tokio wireless station. The Review was held in Yokohama Bay, and the Japanese vessels present numbered 186, and included all the capital ships, except the "Ise" and the "Kirishima." A contrast was afforded by the latest battleships, "Nagato" and "Mutsu," of 33,800 tons and armed with eight 16-in. guns; and the old cruiser "Iwate," a relic of the Russo-Japanese War, of 9,750 tons, and four 8-in. guns. A notable addition since the last review, in 1927, was the aircraft carrier "Kaga."

Seven foreign warships were present, the cruisers "Kent," "Berwick" and "Suffolk," from the British Fleet; the United States cruiser "Pittsburg"; the French cruiser "Jules Michelet"; the Italian cruiser "Libia"; and the Dutch cruiser "Java."

NEW NAVAL ATTACHE.—Commander Prince Shimazu has been appointed Japanese Naval Attaché in London, in succession to Captain Koichi Shiozawa, D.S.O., who has been promoted to Rear-Admiral. Prince Shimazu expects to arrive in London about 25th February.

RECONDITIONED BATTLE-CRUISER.—It is reported that in the course of reconditioning the battle-cruiser "Haruna" was fitted with bilges. These are said to have increased her displacement to nearly 30,000 tons, and slightly reduced her speed.

NETHERLANDS.

NEW C.M. BOATS.—Two coastal motor boats for the Royal Netherlands Navy carried out their speed tests in the Estuary of the Thames on 7th December, when they both attained a speed of 40 knots. These are 55 ft. boats, built by John I. Thornycroft & Co., Ltd., and carry an armament of two 18-in. torpedoes, depth charges and Lewis guns. Propulsion is by two 375 h.p. internal combustion engines.

SPAIN.

NEW 10,000-TON CRUISERS.—It is understood that the new cruisers "Balears" and "Canarias" will be of similar design to the British "Suffolk" class. Under the law of 5th July, 1926, three such cruisers are to be built by 1932. The last cruisers to be built for Spain were of 7,850 tons, the "Principe Alfonso" class, of which the name-ship was seen in English waters last summer, when she conveyed King Alfonso to Sweden.

SWEDEN.

NAVAL AIR ARM.—In a statement to the press, Rear-Admiral Lybeck, Chief of the Naval Staff, reviewing the lessons of the 1928 Naval Manœuvres, said "Air reconnaissance has shown itself to be of great importance; at the same time experience has shown that the Naval air arm ought to belong to the Navy and not form an integral part of a common air service. To be of full use to the Navy airmen must see with a seaman's eye and never lose contact with the fleet. In addition, much experience has been gained as to the shortcomings of aircraft. The manœuvres have clearly demonstrated that the air service has its limitations and that it cannot prove of use under all conditions. Thus it cannot, as many maintain, replace surface reconnaissance vessels, which, as opposed to aircraft, are not so dependent on weather conditions. The air arm, from the maritime point of view, is an important complement to the other units; but it cannot entirely replace any of the sea-going craft."

UNITED STATES.

SECRETARY'S REPORT.—The Report of the Secretary of the United States' Navy shows that the battleships "Pennsylvania" and "Arizona" are to be taken in hand for modernization. Progress is being made in the development of voice communication between a disabled submarine and a surface ship. The Report records that with the commissioning of the two aircraft-carriers, "Lexington" and "Saratoga," the actual aircraft operating capacity of the fleet has been trebled in numbers. "However, the total overall increase in fighting efficiency of the fleet is even greater by reason of the fact that these carrier bases enable for the first time co-operation of aircraft in numbers under sustained operating conditions at sea. The Fleet Commander is now able to carry on protracted operations with high performance fighter, observation, bombing and torpedo aircraft, whereas before he has been in general limited to fair weather operations of a very limited nature."

WITHDRAWAL FROM NICARAGUA.—On 7th January, orders were given for 1,500 bluejackets and marines to be withdrawn from Nicaragua as soon as transportation could be arranged.

CRUISE TO SOUTH AMERICA.—It was announced in December that the Scouting Fleet would pass through the Canal from the Atlantic and join the Battle Fleet for exercises in the Pacific, and for a visit to Callao from 28th February to 13th March. The Control Force is scheduled to visit Cartagena, Colombia, on 9th and 10th April, and Jamaica from 15th to 17th April.

YUGOSLAVIA.

NEW SUBMARINES.—The submarine "Smeli," built by the Ateliers et Chantiers de la Loire, Nantes, was launched in December, 1928. A sister-vessel, the "Ostuelnik," is in a forward state on the stocks. They are of 620 tons, 227 feet long, and driven by two 740-h.p. motors.

ARMY NOTES

HOME.

APPOINTMENTS AND PROMOTIONS.—His Majesty the King has been pleased to approve of the appointment of Lieutenant-General Sir W. Hastings Anderson, K.C.B., as Colonel of The Cheshire Regiment, in succession to Major-General Sir Edward R. C. Graham, K.C.B., K.C.M.G., retired pay; Colonel C. W. Macleod, C.M.G., D.S.O., Colonel (temp. Brigadier) G. M. Lindsay, C.M.G., D.S.O., and Colonel (temp. Brigadier) C. M. Wagstaff, C.M.G., C.I.E., D.S.O., as Aides-de-Camp to the King, in succession to Colonel A. E. W. Harman, C.B., D.S.O.; Colonel Sir Hugh J. Elles, K.C.M.G., C.B., D.S.O., and Colonel H. L. Pritchard, C.B., C.M.G., D.S.O., who have been promoted to the rank of Major-General.

The Duke of Sutherland has been appointed Parliamentary Under-Secretary of State for War vice the Earl of Onslow. The Earl of Onslow to be His Majesty's Paymaster-General vice the Duke of Sutherland. This transfer is made in order that Lord Onslow may be available to assist with the Local Government Bill in the House of Lords.

Major-General H. R. Peck, C.B., C.M.G., D.S.O., to be Commander of the 44th (Home Counties) Division, Territorial Army; Major-General W. H. Beach, C.B., C.M.G., D.S.O., to be Commander of the 42nd (East Lancs) Division, Territorial Army; Major-General H. L. Pritchard, C.B., C.M.G., D.S.O., to be General Officer Commanding, Malaya; Brigadier W. W. Pitt-Taylor, C.B., C.M.G., D.S.O., A.D.C., Commanding 5th Infantry Brigade, Aldershot, to be Major-General, and to be Director of Recruiting and Organization in succession to Major-General W. H. Bartholomew, C.B., C.M.G., D.S.O., appointed Commandant, Imperial Defence College.

Major-General F. F. Ready, C.B., C.S.I., C.M.G., D.S.O., Commanding, Northern Ireland District, has been appointed to the command of the 1st Division at Aldershot, vice Major-General Sir John Duncan, K.C.B., C.M.G., C.V.O., D.S.O.

Major-General A. G. Wauchope, C.B., C.M.G., C.I.E., D.S.O., Commander, 44th (Home Counties) Division (Territorial Army), succeeds Major-General F. F. Ready, C.B., C.S.I., C.M.G., D.S.O., Commander, Northern Ireland District.

NEW MECHANICAL TRANSPORT COMPANY.—A Mechanical Transport Company is to be formed for service with the British troops in Egypt, to be designated the 39th Company (Mobile Repair Unit), Royal Army Service Corps.

CHANGES IN DESIGNATION.—The 3rd/6th Dragoon Guards will in future be designated the 3rd Carabiniers (Prince of Wales's Dragoon Guards). Their title for official correspondence will be 3rd Carabiniers, and the abbreviated title of the regiment will be 3rd D.G.

The 1st Battalion, The Monmouthshire Regiment, will in future be designated the 1st (Rifle) Battalion, The Monmouthshire Regiment.

The titles of the appointments of General Officer Commanding, 1st, etc., Division, and Brigade Commander, 1st, etc., Brigade, will in future be Commander, 1st, etc., Division, and Commander, 1st, etc., Brigade, respectively.

The titles of the appointments of C.R.A. and C.R.E. will be Commander, Royal Artillery, and Commander, Royal Engineers.

DISBANDMENT.—The Royal Artillery (Gibraltar) Band, Gibraltar, has been disbanded.

THE STAFF COLLEGE, CAMBERLEY.—It has been decided to limit the number of officers of technical arms admitted to the Staff College, Camberley. The number of such officers who can with advantage be employed on the Staff has been calculated, and the number to be admitted to the Staff College annually will be published in Army Orders. For the entrance examination to the Staff College being held in February, 1929, the Army Council have limited the number of vacancies to be offered to technical arms by competition to six. These will, so far as possible be allotted in the following proportion: Royal Engineers, four; Royal Corps of Signals, one; and Royal Army Service Corps, one. Any remaining vacancies which it may be desirable to fill from officers of technical arms will be filled by nomination.

THE BUSBY FOR GUNNERS AND ENGINEERS.—Official approval has been given for the introduction of the busby as the full dress head-dress for the Royal Artillery and the Royal Engineers, in place of the blue helmet at present authorised. But Officers who are in possession of blue helmets at present authorised may continue to wear them on those occasions when they wear full dress.

The busby will be of black coney skin, 6½ inches high in front, and 7½ inches high at the back; with a cloth bag of scarlet for the Royal Artillery and of light blue for the Royal Engineers, fitted in the top of the busby and falling down the right side to the bottom; white goats' hair plume with ring and gilt grenade of regimental pattern to be worn on the left side.

SOLDIERS' EDUCATIONAL TRAINING.—The results of the recent examination for Army Special and 1st Class Certificates of Education are reported to have been most satisfactory. 4,214 candidates presented themselves for examination and 61 obtained Special Certificates, and 1,281 1st Class Certificates. The percentage of certificates gained was 56 per cent. as against 52 per cent. in March last. The papers showed an improvement in workmanship; handwriting and spelling both making a marked advance.

Altogether there are at present 13,164 warrant officers, N.C.O's and men in possession of 1st Class Certificates, and 628 in possession of the Special Certificates, which is equivalent to Matriculation.

THE ARMY MEDICAL ADVISORY BOARD: NEW CONSULTATIVE COMMITTEE APPOINTED.—The Army Medical Advisory Board will in future consist of the Director General, Army Medical Services, as President; four civilian members of the medical profession appointed by the Secretary of State for War; the President of the Medical Board of the India Office (*ex officio*), when matters concerning India are under discussion; and a Deputy-Assistant-Director-General of the Army Medical Department as Secretary. The Board will meet three times a year and will advise the Secretary of State on any question of policy in connection with Army Medical Services, on which he may desire to consult them.

The following have been appointed: President, Lieutenant-General Sir Matthew H. G. Fell, Director-General, Army Medical Services; Chairman, Hon. Major-General Sir Berkeley G. S. Moynihan, Bart.; Members, Hon. Major-General Lord

Dawson of Penn, Hon. Major-General Sir Cuthbert Wallace, Professor D. P. D. Wilkie; Secretary, Major C. M. Drew.

It has also been decided to appoint a Committee, to be known as the Army Medical Directorate Consultative Committee, constituted as follows: Chairman, The Director-General, Army Medical Services; Vice-Chairman, The Deputy-Director-General, Army Medical Services; six civilian members of the medical profession who hold instructional or other appointments at University centres or Medical Schools; and one civilian member of the Chemical Warfare Committee, and a Secretary. The civilian members will be appointed by the Secretary of State on the nomination of the Director-General, and will normally serve for three years. The committee will advise the Director-General, Army Medical Services, as to the supply of candidates for the Regular Royal Army Medical Corps and its reserves; postgraduate and other courses of instruction for R.A.M.C. officers; and such administration or professional questions as may be referred to it.

The following members have been appointed: Professor J. Barcroft, Lieutenant-Colonel Sir Robert A. Bolam, Colonel Sir E. Farquhar Buzzard, Colonel T. R. Elliott, Captain J. Fraser, Colonel G. E. Gask, Colonel A. E. Webb Johnson, Secretary, Major C. M. Drew.

BRITISH EMPIRE ORDER MEDAL: AWARDS TO SOLDIERS AND NURSES.—The Medal of the Military Division of the Order of the British Empire for gallantry, may be awarded to an officer or soldier, or a member of the military nursing service who performed an act of gallantry whilst engaged in military duty during a campaign (but not in action), or in peace time. It is also announced that the Medal of the Military Division of the Order of the British Empire for meritorious service may be awarded to a non-commissioned officer or soldier below the rank of warrant officer, recommended in peace or war, for specially distinguished or meritorious service of a high standard. The faithful or zealous performance of ordinary duty will not be sufficient in itself. There must be either: (a) special services of a high degree of merit, such as discharge of special duties superior to the person's ordinary work; or (b) highly meritorious performance of ordinary duties where those have entailed work of a dangerous or specially trying character.

THE KING'S MEDAL FOR 1928.—The King's Medal with clasp "1928" for the champion shot of the Military Forces stationed at Home has been won by Warrant Officer J. Williams, 4th Battalion, Queen's Own Royal West Kent Regiment (Territorial Army).

TERRITORIAL ARMY.

REORGANIZATION OF INFANTRY BATTALIONS.—The reorganization of Infantry battalions of the Territorial Army into three Rifle Companies and one Machine-gun Company on the basis of the new organization of Regular Army infantry battalions, will come into effect in April, 1930. The intention is to form the Machine Gun Company by converting one of the present companies, and, at the same time, to abolish the existing Machine-gun Platoon of the Headquarter Wing. The selection of the particular company for conversion will be governed by local conditions as to accommodation and permanent staff, with a view to minimising such expenditure as may be involved on these heads.

The reorganization will necessitate a reduction of establishment from 656 to 604 all ranks per battalion. Enlistments and re-engagements will, therefore, during the next eighteen months, be so regulated as to ensure that the strength

shall be in accordance with the new establishment. There will be no change in the establishment of the rifle companies.

The Army Council see no objection to units training in 1929, as far as they can, on the new basis in anticipation of formal re-organization, provided such advance training does not entail any issue of extra machine guns or stores in excess of those allowed by the present establishment.

DOMINION FORCES.

THE KING'S MEDAL, 1928.—The King's Medal with clasp "1928," for the champion shot of the Dominion Forces, has been won by the following:—

- (a) *Australian Forces.*—Warrant Officer (Hon. Lieut.) J. Hutchison, Australian Instructional Corps;
- (b) *New Zealand Forces.*—L/Cpl. S. W. Bernet, 1st Battalion, The Wellington Regiment;
- (c) The clasp "1928", for the champion shot of the Military Forces of the Union of South Africa has been won by Sergt. L. D. Busschau, Class "A" Reserve, 8th Infantry Battalion (Transvaal Scottish), who won the Medal in 1927;
- (d) The clasp "1928", for the champion shot of the Military Forces of Southern Rhodesia has been won by Company Q.M.S. F. H. Morgan, Southern Rhodesia Territorial Force, who won the Medal in 1927.

REGIMENTAL ALLIANCES.—His Majesty the King has been pleased to approve the following Alliances:—

The New Brunswick Dragoons, Non-Permanent Active Militia of Canada, to The Royal Scots Greys (2nd Dragoons).

The Northumberland Regiment, Non-Permanent Active Militia of Canada, to The Northumberland Fusiliers.

The Lincoln and Welland Regiment, Non-Permanent Active Militia of Canada, to The Royal Berkshire Regiment (Princess Charlotte of Wales's).

The Ceylon Planter's Rifle Corps to The Rifle Brigade (Prince Consort's Own).

The South African Administrative, Pay and Clerical Corps to the Royal Army Pay Corps.

The Queen's Rangers, 1st American Regiment of the Non-Permanent Active Militia of Canada, to The Queen's Royal Regiment (West Surrey).

The 78th Field Battery, Canadian Artillery, to the 78th Field Battery, Royal Artillery.

CANADA.

NEW CHIEF OF THE CANADIAN GENERAL STAFF.—Brigadier A. G. L. McNaughton, C.M.G., D.S.O., has succeeded Major-General H. C. Thacker, C.B., C.M.G., D.S.O., as Chief of the Canadian General Staff.

Brigadier McNaughton is forty-one years of age and was educated at McGill University, Montreal. He was gazetted Lieutenant in the 3rd Battery, Canadian Field Artillery, in May, 1910. As a Major he went to France in 1915 with the Canadian Expeditionary Force. He was Brigadier-General Commanding Canadian

Heavy Corps Artillery in France from November, 1918, to March, 1919. After his return to Canada he was appointed Director of Military Training and Staff Duties in January, 1920, and held that appointment until September, 1925, and was also Deputy Chief of the General Staff from January, 1923, until December, 1926. In 1927 he attended the Imperial Defence College as the first Canadian military representative, and on returning to Canada was appointed District Officer Commanding Military District No. 11, where he remained until assuming his new post.

FOREIGN

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BELGIUM.

ARMY REORGANIZATION.—All projects for army reform in Belgium can be grouped under three headings:—

- (a) The Socialist scheme of reducing the late ten months' service to that of six months only;
- (b) The necessity of providing a covering force throughout the year on the German frontier;
- (c) The question of recruiting by regions and the use of one or of two languages (French or Flemish) in units.

The question of the length of service is put first because it is on this sandbank that the ship of state grounded early this year.

Briefly, the Socialists insisted that six months' service was (i) essential for the civil, economic development of the country; (ii) sufficient for military training; and (iii) feasible from the point of view of providing the covering force. The General Staff and the Government denied the truth of all these statements.

A special Mixed Commission composed of politicians and leading soldiers was formed in January, 1928, and sat more or less continuously until March, studying the whole question of the Belgian military organization and hearing the evidence of leading men, both soldiers and civilians. The evidence before the mixed commission shows two divergent theories of the roles to be filled by the Belgian army on mobilization and, in consequence, the type of army required.

As a result, Bills for Army Reform were laid before Parliament embodying the proposals of the Government, which consisted of a compromise between the desire to reduce the period of service and the views of General Galet, Chief of the Belgian General Staff. The debate on Army Reform became an endurance test between the Government and the Opposition. The Socialists produced a vast quantity of amendments and employed every political trick in their endeavour to defeat the Government. Owing to these tactics the Lower House had to sit all through what should have been their summer holidays debating these Bills. Eventually on 17th September, the Bills passed the Chamber of Representatives, and, after a debate of more than ordinary dimensions (three weeks) they passed the Senate on 31st October, 1928. The two laws are known as the *Loi des milices* and the "Linguistic Law."

By the *Loi des milices* the annual contingent is to remain 44,000, who serve :—

	2,300	for 14 months.
	3,600	" 13 "
	15,100	" 12 "
	23,000	" 8 "
	<hr/> 44,000	

By the *Linguistic Law* :—

- (i) 2nd Lieutenants in the active army must know both French and Flemish ;
- (ii) Sergeants and upwards before promotion must pass an examination to show they have a thorough knowledge of the language used in the unit in which they are instructors ;
- (iii) Complete instruction of the soldier must be given in his mother tongue, and soldiers speaking the same language must be grouped by companies ;
- (iv) All communications between officers and non-commissioned officers must be carried out in the language used in the unit ;
- (v) All official documents will be published in the two national languages, printed side by side.

This Law will come into force in January, 1931. The effect of this Law will be to divide the army into Flemish and Walloon (French speaking) formations.

FRANCE.

NEW INFANTRY MANUAL.—Part I of the new Infantry Manual has appeared, this being the first of the three parts into which the manual will be divided.

The preface may be summarised as follows :—

- (i) The French realise that they cannot train, under the new scheme of only one year's service, junior non-commissioned officers to lead the rifle and L.A. teams (*équipes*) which used to form two separate parts of their sections (*groupes de combat*). They also realise that a large majority of their section leaders (*chefs de groupe*) will, on mobilization, be reservists and undoubtedly rusty. They have, therefore, simplified their battle formations and made the *groupe de combat* practically a single unit under the immediate control of its *chef*.
- (ii) In their new light automatic the French realise they have a really first class weapon, which has trebled the fire power of the infantry company. As a natural corollary the machine gun company can now be used in its proper role of giving covering fire from a distance. It will be remembered that the old light automatic was so unreliable that it was the normal practice to attach a section of machine guns to the infantry company and these heavy weapons had to try and keep pace with the infantry advance.

At war strength the *groupe* consists of :—

1	<i>Chef de groupe</i>	
1	Corporal	
1	Firer	} L.A.
1	Loader	
3	Ammunition carriers	
4	Riflemen	
1	Rifle bomber.	

The French platoon virtually now consists of three L.A. sections with very small bayonet power and the duty of these *fire* units is to support each other's advance to within 400-200 yards of the enemy's position.

The following is a summary of the preface of this volume :—

After the war, there was issued as rapidly as possible the Provisional Manual for Infantry Training dated 1st February, 1920. Had not three important events intervened, that manual could have continued in every day use.

These events are :—

- (a) The issue of the Provisional Instructions on the Tactical Employment of Higher Formations (*Grandes Unités*);
- (b) *The Reorganization of the Army*, comprising the adoption in the near future of one year's colour service, a considerable reduction in the number of the units of the *Armée Active* and a corresponding increase of units formed on mobilization;
- (c) *The increase in the fire power of infantry*, due especially to the adoption of the new light automatic, which has properties comparable to those of the machine gun up to a range of 1,200 metres.

The new Laws on the Organization of the Army envisage the transition to one year's colour service and, on mobilization, an ever increasing proportion of men and cadres from the reserve, both in active units and in those formed on mobilization. The natural result is the necessity for still further simplification, for cutting down training programmes to bare essentials, and for creating more rapid means of training the non-commissioned officers.

Also, instead of insisting on all infantrymen being first good riflemen, the necessity has arisen for deciding, as soon as the conscripts arrive in barracks, on the selection of the personnel for the machine guns and close support weapons, and for the personnel for observation and intercommunication duties.

The need of regulations within the capacity of the reserve non-commissioned officer and officer, containing all the tactical information indispensable to them, has led to the adoption of different methods of presenting the instruction regarding the conduct of fighting for the different units.

For the *groupe*, the *section* (platoon), and even the *company*, it becomes increasingly important to lay down a limited number of essential formations, and to explain the cases of their employment by giving rules and not tactical considerations which might be interpreted differently. The opinion that there was no need to describe for the *groupe* its normal fighting formations or to lay down set forms has not proved sound, in view of the fact that the majority of the *groupes* will be commanded, on mobilization, by sergeants of the reserve. For the *battalion* and the *regiment*, on the contrary, the conduct of battle demands a more complete knowledge of the tactics of the arm. Besides it will be far more useful to junior officers, who will have to carry out the instructions, if they understand the reasons underlying them.

Simplicity has been sought in the expression of ideas and in the suppression of the less useful formations. This effort at simplification must be completed by indicating to the cadres those parts of the text which they should comprehend thoroughly, and those which are merely useful as information.

(2) The adoption of the *fusil mitrailleur*, 1924, guarantees efficiency at short and medium ranges. Advantage should be taken of this circumstance to exploit the properties of machine guns to the full by extending their limits of employment. On the other hand, the offensive power of infantry fire has become still further

increased from the fact that the number of close support mortars has been doubled, while a marked improvement has been made in their accuracy.

Fire thus becomes the vital factor in a fight and the tactics of small infantry units become the art of distributing these units with a view to producing the required fire. It is less applying a question of more or less subtle movements against certain parts of the front or flank of the enemy, as of concentrating a sufficient number of projectiles on well-selected points or areas.

To-day the infantry possess the means of effecting fire of such power that, when the methods of *observation, inter-communication and supply*, now being improved, have advanced on a par with armament, it will be possible, in the attack, to extend beyond the fronts hitherto regarded as normal.

Meanwhile, training in the use of existing weapons assumes, in the smaller units, an increasing importance.

In defence, where supplies are comparatively easy, the large allotment of powerful and accurate weapons to the infantry greatly increases its power of resistance.

Finally, the respective roles of the light automatic and the machine gun become easier to define, and except in special cases, the machine-gun sections, while remaining under the orders of their captain, will be allotted, by their battalion commander, tasks distinct from those of the light automatics. The drawing up of a fire plan (*base de feu*) in an offensive is now laid down as the normal procedure.

(3) The instructions concerning the maintenance of contact have been rendered less hard and fast; they appeared to lead to restricting the freedom of decision of the commander.

The possibility of carrying out an immediate counter-attack has been limited to the section (platoon) and company. Counter-attack is carried out by fire; this necessarily involves preparation and delay in execution.

It is laid down that the role of the reserves in the exploitation of a first success consists less of following the first echelon through a breach it has succeeded in making than of enlarging this breach by a fire attack on the two salients which it creates.

A notable modification has been introduced with regard to the fighting methods of the *groupe* and the *section* (platoon).

It was necessary to counteract the apparent effacement of the role of the *section* leader; also the abuse which persisted of lines of riflemen being too often preferred, without adequate reason, to a much less visible formation and one that is the easiest to lead, viz., the column.

By eliminating one corporal in each *groupe*, it has been possible, to provide the *section* (platoon) commander with an assistant non-commissioned officer, an observer and a corporal; the latter capable, if necessary, of taking command of the three rifle bombers of the *section* (platoon).

The *chef de groupe* is in direct command of the *groupe* as a whole; his role—now much simplified—is never to manoeuvre, but merely to make his *groupe* as a whole advance to its objective.¹ The light automatic is kept in constant readiness to develop its maximum fire power; the riflemen act first, possibly, as scouts; then, when sufficiently close to the enemy, provide it, if necessary, with the support of their own fire; and finally, when within assaulting distance the *groupe* comes to grips with the enemy, each man with his own weapon.

¹The *section* (platoon) is the smallest unit capable of effecting an independent manoeuvre; under the orders of its commander, the three *groupes* can—by advancing alternately—ensure the continuity of movement, as well as of fire.

Note.—Under the 1920 Manual the two *équipes* (rifle and L.A. teams) of the *groupe* could be and were encouraged to manœuvre as separate units. The French now find they have not the time to train leaders for these *équipes* and the *chef de groupe* is to keep a tight hand on the two *demi-groupes* as they are now styled.

(4) The employment of the company and larger units does not change. What is essential is, that the directors of the training exercises of these units should be imbued with the vital importance of *Fire* and that they do not look upon movement as an end in itself.

Before the delivery of the final assault, the manœuvring of a small infantry unit should have but the single aim of bringing to bear a fire power superior to that of the enemy.

In the mind of the commander, the defining of areas to be swept by fire should always precede the choice of fire positions, or of movements to be carried out. No distribution of troops is of any value unless it allows of fire power being developed to its maximum.

It follows that—for small infantry units—the knowledge and employment of their weapons form the essential aim of training.

The confidence of the infantry in their own strength is proportionate to their skill in making use of weapons which they know to be effective.

The military value of troops depends upon this skill and the confidence which it inspires . . .

. . . Although war assumes new forms in accordance with the development of the art of destruction, yet it remains in principle a struggle of wills and morale.

COMPARATIVE TABLE OF FIRE POWER.

British Brigade.						
Section—	L.A.'s.	Rifles.	Dis- charger cups.	Revol- vers.	Mach- ine guns.	Anti- tank guns.
Rifle	—	8	4	—	—	—
L.A.	1	6	—	2	—	—
Platoon	2	30	8	5	—	—
Rifle Company	8	129	32	22	—	—
Machine Gun Company	—	125	46	—	16	—
Battalion	26	537	96	125	16	4
Brigade	104	2,148	384	500	64	16

French Regiment.							
	L.A.'s.	Rifles.	V.B. with dis- chargers.	Revol- vers.	Mach- ine guns.	Stokes mor- tars.	.37-mm. guns.
Groupe de Combat	1	9	1	2	—	—	—
Section	3	30	4	6	—	—	—
Compagnie de fusilleurs	12	140	16	27	—	—	—
Voltigeurs.							
Compagnie de mitrailleuses	—	121	—	38	16	—	—
Bataillon	36	541	48	119	16	—	—
Régiment	108	1,623	144	357	48	6	3

Note.—

- (1) Rifles and carbines in French regiments are grouped together.
- (2) Headquarters personnel are not included in above figures, as under:—
 British Brigade.—Battalion Headquarters Wing, Nos. 1 and 3 Groups (less A.A. Lewis guns): Total, 8 revolvers, 170 rifles.
 French Régiment.—Bataillon Nos. 1, 2 and 3 groups consist of signallers, intelligence, supply and sanitary personnel. Regimental staff, *Section de Commandement*: clerks, cyclists, signallers, intelligence personnel, liaison non-commissioned officers; *Peloton de Cavaliers* (escort), *Compagnie Hors Rang*: cooks, drivers, sappers, storekeepers, clerks, farriers, sanitary and veterinary personnel, butchers, etc.; *Compagnie d'Engins d'Accompagnement*.

JAPAN

WITHDRAWAL OF TROOPS FROM SHANTUNG.—The gradual calming down of the situation in Shantung since the summer has allowed Japan to withdraw the bulk of her expeditionary force from Shantung and to return to normal peace conditions in Korea, Manchuria, and the Peking-Tientsin area. At the close of 1928 the Japanese troops in Shantung consisted of the 3rd Division, restored from a war to a peace basis, also some railway and telegraph units, numbering between 5,000 and 6,000 in all. It now only remains for the Chinese Nationalist Government to give a satisfactory guarantee for the safety and protection of Japanese lives and property in Shantung before this remnant is withdrawn.

UNITED STATES.

REORGANIZATION OF THE CAVALRY.—(1) It is now intended that cavalry divisions shall take the field in the first instance at peace establishments, these being approximately half the war establishments. It is considered that to double the strength of cavalry units on mobilization by the introduction of imperfectly trained men and animals would be prejudicial to their efficiency to an extent not compensated for by the increase in numbers. Units are to be brought up to war establishments gradually as trained reinforcements become available.

Owing to this somewhat singular decision it becomes necessary to study the new peace organization of the cavalry division and to compare it with the war organization.

The following table permits a rough comparison to be made:—

	Peace establishment.	War establishment.
Cavalry Division—		
Total strength (approximate)	5,000	9,800
Number of cavalry brigades in a cavalry division	2	2
Number of cavalry regiments in a cavalry brigade	2	2
Cavalry Regiment—		
Total strength (approximate)	730	1,440
Number of squadrons in a regiment	2	3
Machine guns in a regiment	8	12
37-mm. guns	2	3

Cavalry Squadron —			
Total strength (approximate)	290		360
Cavalry Division Artillery—			
Number of battalions	1		2
			(1 regiment)
75-mm. guns	12		24
Armoured cars	12		36
		(1 troop)	(1 squadron)
Cavalry Divisional Train—			
Number of M.T. companies	2		3

War establishment tables have also been produced for a cavalry corps. This formation, which only exists in war, will contain two or three cavalry divisions and corps troops. It is stated that its normal role will be to "operate as a strong mobile force of all arms in carrying out special missions of reconnaissance and combat."

As regards further mechanization, it is stated that the policy will be "to adopt motor equipment to the greatest extent possible, so long as each piece of motor equipment adds to the mobility of the cavalry and does not interfere with its ability to go over any kind of country, and under any conditions of road and weather . . . it is believed that the horse-soldier, like the foot-soldier, cannot be replaced by any machine as yet developed, nor is it anticipated that any such machine will be developed. So long as there are marshes to cross, rivers to swim, woods to pass through, or mountains to climb, just so long will the cavalryman and the infantryman be necessary." Feeling is strong against belittling the value of the cavalry arm. During Lord Allenby's recent visit to America, the officers who met, or heard, the Field-Marshal, were greatly elated at his reference to the future of cavalry; more especially as they regard him as the outstanding cavalry leader of the war.

(2) The new machine gun troop, which eliminates the old brigade machine gun squadron, has 3 platoons of 4 guns each, with a strength of 7 officers and 169 men. The old machine gun squadron had a total of 18 guns to a brigade, whereas now the brigade, with its 2 regimental machine gun troops, has a total of 24 guns. In addition, each machine gun troop now contains an anti-aircraft section, equipped with 3 cross-country cars, with anti-aircraft machine guns mounted on each car, and a 1-pdr. section equipped with 3 1-pdrs. for employment in particular against hostile machine gun nests, armoured cars and light tanks.

(3) The inclusion of an armoured car squadron is a new departure. The unit contains a small squadron headquarters, and 3 armoured car troops, with a total strength of 18 officers, 260 other ranks and 36 cars (war organization). So far only 1 troop has been organized, consisting of 3 platoons of 4 armoured cars each, with a strength of 5 officers and 84 other ranks.

The cars with which experiments are being conducted are of two types:—

- (a) Armoured car, light, T-1. Weight 2,500 lb. Engine: Pontiac, 6-cylinder, 40 b.h.p. Speeds, m.p.h.: 1st, 5; 2nd, 15; 3rd, 40. Crew: 1 driver and 2 gunners. Armament: 2-30 machine guns, rear gun on anti-aircraft mount. Cruising radius: 150 miles. The car is armoured against .30 ammunition in front of the driver. It is built on a standard chassis, equipped with 32 x 6.30-inch balloon tyres; has 4-wheel brakes and standard equipment; carries 5,000 rounds of .30 ammunition.

The wind shield has been removed and replaced by $\frac{1}{4}$ -inch armour, of sufficient height to allow the driver to look over. A belt of armour also covers the back of the front seat. One machine gun is mounted over the wind shield in a position to be served by the gunner sitting next to the driver. The tonneau is open, and has a machine gun mounted on it ready for fire against aircraft or ground targets. In view of the absence of armour on their flanks it is likely that the crew of this vehicle will have to suffer for the good all-round view they obtain.

- (b) Weight, 5,500 lb. Engine, La Salle, 8 cylinder V-type; 60 b.h.p. Speeds, m.p.h.: 1st, 5; 2nd, 20; 3rd, 45. Crew, 4. Armament: 1 30 machine gun. Cruising radius, 150 miles. This is a completely armoured car with a folding armoured top which can be closed so as to afford overhead protection. The armour is $\frac{1}{2}$ inch thick and proof against service bullet at all ranges above 80 yards. The car carries 7,200 rounds of .30 ammunition and a machine gunner is seated next to the driver. There are ports in the armour for pistol or rifle fire. The car is built on 125-inch wheel base 1928 chassis, equipped with disc wheels taking 32 by 7.5-inch balloon tyres. The machine gun can be elevated above the level of the roof. Probably 1 37-mm. gun will also form part of the armament. The total height of the car from the ground is 72 inches.

(4) Previously a squadron was attached to a cavalry division when the situation required it, but this has proved unsatisfactory and a divisional air arm is now being incorporated into war and peace establishments. The unit is identically the same as the one included in the infantry divisional organization. (In the United States the air force forms part of the army.)

(5) Under the old organization a divisional train included a headquarters, two wagon companies, and four pack trains (with 60 wagons in a company and 50 pack mules in a train). The new organization substitutes one motor transport company for one wagon company in peace, and two motor transport companies for one wagon company in war. A divisional train is thus partly mechanized and partly horsed.

(6) Tests are being carried out with a view to replacing the present rifle with a semi-automatic shoulder rifle, which it is considered will be particularly suitable for cavalry. No particular type has yet been decided on.

THE SOCIETY FOR ARMY HISTORICAL RESEARCH

This Society was founded in 1921 with the object of encouraging research into Army Antiquities, into matters connected with Regimental History, Uniforms, Dress and Equipment of the past, old Military Customs and Traditions, the Art of War in bygone days, Pictures, Prints, Medals, Relics and other subjects of similar interest.

The Society publishes a quarterly Journal and occasional Special Publications, copies of which are sent, post free, to all members.

Amongst articles which have appeared are the following :—

The " Government " or Black Watch Tartan. (Illustrated).

Tangier—1680 ; the Diary of Sir James Halkett. (Special publication).

The Royal Military Academy, Woolwich, in 1809.

Badges of English County Militia Regiments. (Illustrated).

The Order of Merit—5th Regiment of Foot, 1767-1856. (Illustrated).

" Memorial " of Northern Actions during the Civil War, 1642-4. From a MS. by Sir Thomas Fairfax.

Army Inspection Returns, 1753-1804.

The Orderly Book of Lord Ogilvy's Regiment in the Army of Prince Charles Edward Stuart, 1745-6. (Special publication).

Reminiscences of a Woolwich Cadet of 1802. (Illustrated).

Army Uniforms in a painted Church window—Farndon, Cheshire. (Illustrated).

The Siege and Capture of Bristol—1643. (Illustrated).

Monuments and Memorials of Soldiers in the London City Churches. (Illustrated).

Regimental Medals of the 88th and 94th Regiments. (Illustrated).

Highland Military Dress. (Illustrated).

The Colours of the 71st Foot.

The Evolution of the Gorget. (Illustrated).

British Officers who served in the Portuguese Artillery between 1762 and 1780.

A Survey or Muster, of the Armed and Trained Companies in London, 1588-1599. (Illustrated).

The King's Body-Guard of the Yeomen of the Guard, 1485-1920.

The English Red-Coat.

" Notes, Questions and Replies " form a prominent feature (occupying about one-third of the Journal), with the object of fostering a spirit of enquiry into all matters of military interest.

The annual subscription to the Society, payable on 1st January, is One Guinea. All interested in the History of the Army are invited to join and to contribute articles. Any person desirous of becoming a member may be admitted, subject to the approval of the Council. Libraries, Clubs, Societies and Regiments may, through their representatives, be admitted to membership.

All back numbers of the Journal are obtainable by new members at a reduced rate.

Communications should be addressed to : THE HON. SECRETARY, Society for Army Historical Research, c/o War Office Library, Whitehall, London, S.W.1.

AIR NOTES

ROYAL AIR FORCE.

PERSONNEL.

CHIEF OF THE AIR STAFF.

It was officially announced on 21st December, 1928, that Marshal of the Royal Air Force, Sir Hugh M. Trenchard, Bart., G.C.B., D.S.O., D.C.L., LL.D., would relinquish his appointment as Chief of the Air Staff on 31st January, 1930, when he will be succeeded by Air Chief Marshal Sir John M. Salmond, K.C.B., C.M.G., C.V.O., D.S.O., A.D.C.

APPOINTMENTS OF AIR OFFICERS.

Rank and Name.	To	Date.	Remarks.
Air Chief Marshal Sir John M. Salmond, K.C.B., C.M.G., C.V.O., D.S.O., A.D.C.	Air Ministry (A.M.P.)	1.1.29	On promotion to the rank of Air Chief Marshal, and on appointment as Air Member for Personnel, vice Sir P. W. Game, K.C.B., D.S.O.
Air Marshal Sir John F. A. Higgins, K.C.B., K.B.E., D.S.O., A.F.C.	Air Ministry (A.M.S.R.)	1.1.29	On promotion to the rank of Air Marshal.
Air Vice-Marshal Sir E. L. Ellington, K.C.B., C.M.G., C.B.E.	Headquarters, Air Defence of Great Britain.	1.1.29	On appointment as Air Officer Commanding-in-Chief.
Air Vice-Marshal Sir P. W. Game, K.C.B., D.S.O.	Retired at his own request.	1.1.29	
Air Vice-Marshal F. R. Scarlett, C.B., D.S.O.	Headquarters, Fighting Area.	1.1.29	On appointment as Air Officer Commanding.
Air Vice-Marshal Sir R. Brooke - Popham, K.C.B., C.M.G., D.S.O., A.F.C.	Headquarters, Iraq Command.	19.11.28	On appointment as Air Officer Commanding.
Air Vice-Marshal H. C. T. Dowding, C.B., C.M.G.	Air Ministry (D. of T.)	1.1.29	On promotion to the rank of Air Vice-Marshal.
Air Commodore C. R. Samson, C.M.G., D.S.O., A.F.C.	Headquarters, Fighting Area.	1.10.28	For Air Staff duties.
Air Commodore F. V. Holt, C.M.G., D.S.O.	Air Ministry (A.M.S.R.)	7.12.28	On appointment as Director of Technical Development.
Air Commodore J. A. Chamber, C.B., C.M.G., D.S.O., O.B.E.	Retired at his own request.	7.12.28	
Air Commodore C. S. Burnett, C.B., C.B.E., D.S.O.	Central Flying School.	1.1.29	On promotion to the rank of Air Commodore.
Air Commodore L. F. Blandy, C.B., D.S.O.	Relinquishes temporary commission	30.11.28	
Air Commodore A. D. Warrington-Morris, C.M.G., O.B.E.	Air Ministry (D.O.S.D.)	1.1.29	On promotion to the rank of Air Commodore, and as Head of Signals Branch, from 30.11.28.

Air Commodore N. D. K. MacEwen, C.M.G., D.S.O.	Air Ministry (D. of T.)	1.1.29	On promotion to the rank of Air Commodore.
Air Commodore Hon. J. D. Boyle, C.M.G., D.S.O.	R.A.F. Station, Worthy Down.	1.1.29	On promotion to the rank of Air Commodore, and attached to Headquarters A.D.G.B. for temporary Air Staff duties from 7.12.28.

FLYING TRAINING.—During the period 1st October to 31st December, 1928, the following completed courses of instruction at Flying Training Units:—

	Officers.	Airmen.
Central Flying School	20	5
Ab initio	34	13
Conversion	15	—
Refresher	4	—

OFFICERS ENGINEERING COURSE, HENLOW.—The Council of the Institute of Mechanical Engineers visited the Officers Engineering Instruction Section, Henlow, during November, 1928, in order to comment upon the curriculum and methods of instruction employed, and to decide whether any portion of the course could be regarded as a suitable alternative for part of the Associate Membership Examination.

The intake of pupils attending the course has been increased from twenty-four to thirty per annum.

R.A.F. CADET COLLEGE, CRANWELL.—Twenty-one Flight Cadets completed their courses of instruction at this unit and received permanent commissions in the Royal Air Force.

It has been decided that the Cadet College will be known in future as the Royal Air Force College.

TECHNICAL TRAINING OF AIRCRAFT APPRENTICES.—413 and 57 aircraft apprentices passed out from the School of Technical Training, Halton and Electrical and Wireless School, Flower Down, respectively. Of these, five were awarded cadetships at the Royal Air Force College, Cranwell.

COASTAL RECONNAISSANCE UNITS.

REORGANIZATION.—No. 480 (Coastal Reconnaissance) Flight based at Calshot, has now been renamed No. 201 Flying Boat Squadron.

During the period under review, a new Coastal Reconnaissance unit, No. 203 Flying Boat Squadron, has been formed and is based at Cattewater.

No. 481 (Coastal Reconnaissance) Flight at Malta has carried out the normal training and exercises with the Mediterranean Fleet. This unit has now been renamed No. 202 Flying Boat Squadron.

LOSS OF THREE FLYING BOATS.—On 23rd November, last, two flying boats of the "Southampton" type, belonging to Calshot, broke from their moorings in Portland Harbour, and drifted on to the bows of H.M.S. "Cambrian," which was at anchor. A naval drifter gave chase but the aircraft sank. Later a third flying boat broke from her moorings and was wrecked on the sea wall.

OVERSEAS COMMANDS

ADEN.

No further encroachments into the Protectorate by Zeidi forces have taken place. Air reconnaissances of the Northern frontier, west of the Wadi Bana, have been continued but nothing of unusual interest has been observed. Preliminary steps are being taken with the object of concluding a treaty between His Majesty's Government and the Imam of Yemen, one of the chief points of which will be to define geographically the frontier between the Aden Protectorate and the Yemen.

INDIA.

OPERATIONS AGAINST THE GIGA KHEL AND NEKZAN KHEL.—During the past six months a certain amount of unrest has prevailed in the Khaisara region of the North West Frontier. The Giga Khel and Nekzan Khel, two small Mahsud sections, were guilty of kidnapping two British subjects. They persisted in adopting a defiant attitude towards the Indian Government and, in spite of repeated requests by the sectional Malik, refused to surrender the captives.

In order to prevent the trouble from spreading to the remainder of the Mahsud clan, and also to punish the offenders, it was decided to warn the tribes that the area inhabited by them would be subjected to air action if they failed to comply with the orders of the Government. This was done, and as the tribes still persisted in their defiant attitude, air action by machines of No. 60 (Bombing) Squadron was taken on 15th and 16th November against the villages of the Giga Khel, resulting in their destruction. Operations were then suspended as the guilty sections showed signs of coming to terms. By the 20th November, the sections had submitted and the kidnapped men had been returned. The air action taken was effective in quelling the disturbance and the moral effect on the remaining Mahsud tribes has been considerable. The situation is now normal.

REORGANIZATION.—Certain reorganization of the Royal Air Force in India has taken place involving the disbandment, as formerly constituted, of Nos. 1 and 2 (Indian) Wings stationed at Peshawar and Risalpur, and the institution of station organizations at Kohat and Risalpur, to be known as Nos. 1 and 2 (Indian Wing) Stations, respectively. No. 1 (Indian) Group has been formed at Peshawar.

Nos. 11 and 39 (Bomber) Squadrons were transferred from the Home Establishment to the Indian Command on 29th December, 1928.

IRAQ.

With the exception of an attempted raid by Nejd tribesmen into Iraq, nothing of unusual interest has occurred during the period under review and the situation remains satisfactory.

MOVEMENT OF TROOPS.—On 1st November, the 3/5th Mahratta Light Infantry, the last remaining Imperial Infantry Battalion in Iraq, left Baghdad en route for India. The 63rd Queen Victoria's Own Madras Sappers and Miners also left Baghdad for India on the 9th November.

NORTHERN IRAQ.—Ahmed Begok, chief of the Baliki tribe who inhabit a small area of the country just north of Rowanduz, has now made submission to the Iraq Government and has been brought to Arbil. He was a follower of Sheikh Ahmad of Barzan with whom, it will be remembered, trouble occurred in the

early part of this year. In December of last year, Ahmad Begok definitely refused to pay taxes or to recognise that Government in any way. An attempt was made by Levy Troops to arrest him, but he opposed this by force and succeeded in making good his escape into Turkey, where it was understood he had settled down. His submission, therefore, was somewhat unexpected and is no doubt largely responsible for the settled conditions now prevailing in this area.

SOUTHERN DESERT.—On 29th December a raid on Iraqi shepherds was attempted by a force of about 130 Akhwan tribesmen. For some days reports that a raid was contemplated had been received, and on 28th December Iraqi shepherds who were grazing in the Ath Thalaimah area, seventy-five miles southwest of Sulman, were visited by aircraft and warned to move North. On the following day the aircraft discovered the raiders on the Iraq side of the frontier. The raiders, on observing the aircraft, immediately opened fire. The fire was returned by the aircraft and after a short action the raiders were dispersed.

NEGOTIATIONS WITH IBN SAUD.—In consequence of the breakdown of negotiations with Ibn Saud last August, His Majesty's Government has proposed a settlement by arbitration in order to arrive at a peaceful settlement of all the points in dispute. This offer has been accepted in principle by Ibn Saud.

FAR EAST FLIGHT.

The final stage of the Far East Flight of four Southampton Flying Boats, which left England on 17th October, 1927, was successfully completed with their arrival at Hong Kong on 15th September, 1928.

AVIATION IN FOREIGN COUNTRIES

AFGHANISTAN.

During the revolt which broke out in the eastern Afghan provinces in November, Afghan aircraft, mostly flown by Russian pilots, carried out bombing operations against the rebels. The result is not yet known. The rebels attacked Jalalabad, where they burnt the hangars on the aerodrome and some Afghan Air Force machines which were housed in them at the time.

The disturbances spread to Kabul, which was attacked by the Rebels on 14th December. As telegraphic communication between the British Legation at Kabul and India became uncertain, Sir Francis Humphrys, the British Minister, requested that Royal Air Force machines should carry out daily reconnaissances to report any message which he might put out in ground strips. The first of these reconnaissances was carried out on 18th December, when one of the machines was forced to land on Kabul aerodrome, having been shot through the radiator.

As the situation at Kabul became worse, Sir Francis Humphrys, having obtained permission from the Afghan authorities, requested that, when possible, machines might be sent to Kabul aerodrome to evacuate women and children. Evacuation flights were carried out on five days between 23rd and 30th December, and a total of 126 women and children, including a number other than British, were flown to Peshawar. (See also *International Situation*, page 173.)

FRANCE.

ESTIMATES.—The Air Estimates for the financial year 1929,¹ were passed during the last days of 1928. These Estimates which were the first to be submitted by the newly constituted Air Ministry (see General Service Notes in the last JOURNAL), were passed without much discussion and with a cut of only approximately eighteen million francs. The final figure was 1,821,197,270 francs.

THE AIR MINISTRY.—The Air Ministry is still in the transition stage and it is still quite impossible to gauge the effect of combining the four air services under one control. The personnel question is exercising the minds of the Military and Naval officers, and a certain number of these have reverted to their original Service. Admiral Frorhot, until recently Chief of the Naval Air Service, is one of those who have returned to naval duty.

SCHNEIDER CUP CONTEST.—France has entered a team for this contest, and is reported already to have nominated the pilots. Details are not yet available, but it is probable that the engines will be produced by Hispano-Suiza.

ACCIDENT.—One of the most expert naval aviators, Commandant Compardon, was killed, together with four others when a new type all-metal flying boat fell into the sea off St. Raphael at the beginning of January. It is reported that flying on this machine had been forbidden, and that disciplinary action is being ordered by Mons. Laurent Eynac, the Air Minister.

ITALY.

COMMERCIAL TOURING AIRCRAFT.—To encourage the construction of economic commercial touring aircraft, the Air Ministry and the Royal Italian Aero Club have instituted a competition for light aeroplanes with prizes amounting to 300,000 lire (£3,250). The aircraft must be of all-Italian construction, and the cost of production, including engine, must not exceed 50,000 lire (£540). The following characteristics must be incorporated in all entries submitted:—

- (i) Two-seater with disconnectable dual control in pilot's cockpit.
- (ii) Single engine, of between 75 and 90 h.p., air-cooled and having exhaust manifolds.
- (iii) Minimum speed near ground not above 65 km. per hour (40 m.p.h.)
- (iv) Maximum speed near ground not below 130 km. per hour (81 m.p.h.)
- (v) Practical ceiling not below 2,500 metres (8,200 ft.).
- (vi) Endurance not below 4½ hours.
- (vii) Useful load not below 280 kg. (617 lb.), i.e., weight of pilot, passenger, petrol and oil for 4½ hours and luggage.
- (viii) Folding wings.
- (ix) Undercarriage capable of being replaced by floats.

A test flight round Italy via Rome, Naples, Foggia, Loretto, Ferrara, Padua, Milan, Turin, Bologna, Florence, Pisa, Rome, a distance of 1,918 kms. (1,192 miles) in nine daily stages, will be given and there will also be a technical test.

The competition commenced on 12th September, 1928. Most of the aircraft firms of Italy have entered for the competition, including the Breda, Caproni, Cantieri Navale Triestino and Macchi Companies. The final results are not yet known.

¹ In France the financial and calendar years coincide.

LARGE CIVIL AIRCRAFT.—The S.I.A.I. (Societa Idrovolanti Alta Italia) firm is building a large civil aircraft to be used on overseas air lines. It is derived from the "S.55" flying boat and the power will be supplied by two 1,000 h.p. Isotta Fraschini "Asso" engines.

JAPAN.

NAVAL AIR SERVICE.—Japanese press reports state that trials have been carried out by seaplanes flying from capital ships and cruisers, with most satisfactory results. The catapults used are said to be superior to those in use in American or British ships and the results even better than taking off from the decks of the aircraft carriers "Akagi" and "Hosho."

During the next financial year all capital ships and cruisers are to be equipped with reconnaissance aircraft and each large submarine with a small folding reconnaissance machine of Japanese design.

LARGE FLYING BOAT.—A flying boat, which the Japanese press describe as "the largest bombing flying boat in the world," has been under construction at the Kawasaki Dockyard.

The machine was to be completed by the end of October, but whether this programme was adhered to is not known. It is reported that the machine is of all-metal (duralumin) construction, with a span of 30 metres, and is fitted with an 800 h.p. B.M.W. engine. The machine is to have an endurance of 30 hours and will be able to carry fifty passengers.

PERSIA.

AIR ROUTE TO INDIA.—Subject to various conditions and restrictions, the Persian Government have now permitted Imperial Airways to use the South Persian route between Basra and Karachi, with aerodromes at Bushire and Jask, and with an emergency landing ground at Lingah, for a period of three years from 1st January, 1929. It appears, however, that Imperial Airways will not be in a position to commence their regular weekly service between England and India before 1st April.

AIR MAILS.—The Junkers contract for the air mail service in Persia is as follows:—

- (a) Teheran—Ispahan—Shiraz—Bushire every Thursday, returning on the same day;
- (b) Teheran—Hamadan—Kermanshah—Qasr-i-Shirin every Saturday, returning to Kermanshah the same day and completing the journey on the following morning.

The air mail service for Russia has now been closed down for the winter months, while the Teheran—Meshed service, having lost its initial popularity, has been temporarily suspended.

SOVIET UNION.

CONVERGING FLIGHT, 1928.—The Soviet Air Force carried out its third converging flight in June, 1928. Nineteen aircraft took part starting from eight points in European Russia and flying to Moscow. The machines started from places as far apart as Kharkov, in the Ukraine; Bobruisk, on the borders of Poland; Trotsk, near Leningrad; and Kazan, on the Trans-Siberian route. Sixteen of

the nineteen starters arrived in Moscow, but only three completed the flight in schedule time.

UNITED STATES.

U.S. AIR ESTIMATES, 1929-30.—The Estimates, covering all branches of government aviation, have been made public, and show the following increases or decreases when compared with appropriations for 1928-29 :—

	Estimates 1929-30.	Approps. 1928-29.	+ Increase. - Decrease.
	£	£	£
Army Air Corps	8,898,772	6,291,283	+ 2,607,489
Navy Air Service	6,634,084	6,638,412	- 4,328
Civil Aviation—			
(a) N.A.C.A.	260,000	120,000	+ 140,000
(b) Dept. of Commerce	1,285,452	1,086,870	+ 198,582
(c) Post Office Contract, Air Mail ..	3,460,000	1,687,000	+ 1,773,000
(d) Dept. of Agriculture (Meteorology, etc.)	116,500	15,000	+ 101,500
Total	20,654,808	15,838,565	+ 4,816,243

The 1929-30 figures have yet to be passed by Congress.

REFUELLING AIRCRAFT IN FLIGHT.—The United States Army Air Corps recently carried out an interesting endurance flight, the object of which was to determine the strain of flying on the human system, and to test the absolute endurance of the modern aircraft engine over a protracted period.

The aircraft used during the flight was a standard Army Air Corps transport monoplane (Fokker) with three Wright 220 h.p. air-cooled engines. The cruising speed of this machine is said to be 115 m.p.h. The crew consisted of four officer pilots and one mechanic. Radio-telephonic apparatus was carried.

The refuelling aircraft, with a crew of two, was an Air Corps "C-1" (Douglas) biplane, with Liberty engine and was specially fitted for refuelling the transport. Two 150-gallon petrol tanks and one 40-gallon oil tank were installed in the fuselage. For purposes of transferring fuel from one aircraft to the other a 50-foot length of hose pipe, 2½ inches in diameter, was used, petrol being pumped through at the rate of 75 gallons a minute. Three hundred gallons of petrol were transferred at each refuelling.

The transport plane, named the "Question Mark," commenced its flight at 7.26 a.m. on 1st January and landed at 2.12 p.m. on 7th January, having flown continuously for 6 days, 6 hours and 46 minutes. This constitutes a record for refuelling endurance.

ROYAL AIR FORCE DISPLAY, 1929.

The Royal Air Force Display for 1929 will be held on Saturday, 13th July, at the Royal Air Force Aerodrome, Hendon. Gates open at 10 a.m. Flying will commence at noon and the programme will be completed at about 5.30.

The address of the Secretary of the Royal Air Force Display Committee is now The Royal Air Force Station, Hendon, N.W.9.

AIRSHIP NOTES

GREAT BRITAIN.

NEW AIRSHIPS.

"R.100."—The fin structures of the airship building at Howden are completely erected in position and the covering and doping of rudders and elevators prior to erection is in hand. Installation details of the passenger accommodation are practically completed and all access corridors are fitted. Fuel, oil and water tanks are completed and in position. The installation of fuel, oil, ballast, control and electrical systems throughout the erected hull remains to be completed before the airship will be ready for inflation, and there is a certain amount of installation work yet to be carried out in the power cars.

"R.101."—In the airship building at Cardington, the complete bow structure forward of frame 3 has been assembled, lifted, and joined up in position. The stern portion aft of frame 15 is completely assembled. The hull structure is thus completely erected from the bow to frame 11; the remaining four transverse frames Nos. 12, 13, 14 and 15, with the fin structures, are in varying stages of assembly on the ground. Progress with the passenger accommodation and the various installations in the hull has been satisfactorily maintained and the fitting of the outer-cover has begun.

Further running of the Beardmore heavy oil engine has given satisfactory fuel and oil consumptions and power, but certain modifications to the engine are considered advisable before a type-test is carried out.

AIRSHIP STATIONS.

As stated in the last issue of these Notes, both sheds and the mooring-tower at Cardington and the mooring-tower at Ismailia, Egypt, are complete and ready for operations.

India.—Good progress has been made with the erection of the mooring-tower, which should be completed during the summer.

Canada.—The head has been erected on the tower.

South Africa.—The construction of the proposed mooring-tower for erection upon the site selected by the South African Government at Groutville, Natal, has not yet begun.

GERMANY.

NEW CONSTRUCTIONS.—The Luftschiffbau Zeppelin of Friedrichshafen is planning the construction of a new and still larger airship, to be called the "L.Z.128." The actual dimensions of the ship have not yet been finally settled, but it is believed that it will have a capacity of approximately 5,000,000 cubic feet. The capacity of the "Graf Zeppelin" ("L.Z.127"), its predecessor, is 3,710,000 cubic feet.

The construction of a new and much larger shed to accommodate the new airship is also proposed.

THE "GRAF ZEPPELIN."—The intention of the Zeppelin Company is, apparently, to employ the "Graf Zeppelin" as an experimental and demonstration craft with a view to gaining experience and practice for the operation of airship routes of the future. A North Pole Expedition is planned for 1930.

ITALY.

It is stated that the Italian Air Service has decided to build no more airships, but that the "N.5," sister ship of the ill-fated "Italia," now under construction, will be completed and sold to a foreign government. There is, however, no confirmation of the sale abroad of the "N.5."

SPAIN.

ATTEMPT TO REACH A RECORD FREE BALLOON ALTITUDE.—An attempt to rise to a record height in the Spanish balloon "Hispania" cost the life of the balloonist, Commandante Molas. This officer, in the same balloon, took part in the Gordon Bennet contests both of 1926 (Antwerp) and 1927 (Detroit).

On 16th August, Commandant Molas rose from the Guadalajara Aerostation Park at 8.30 a.m. The balloon, the capacity of which was 2,200 cubic metres, was only inflated up to 1,400 metres; Commandante Molas reckoned on the further inflation (caused by the sun on the hydrogen) to enable the balloon to rise more rapidly. Nine hundred kilos of ballast was carried, in bags of 15, 10 and 5 kilos.

No news was received during the day of the descent of the balloon, which was expected about 4 p.m. At midnight, however, information was telegraphed that a balloon and the dead body of its pilot had been found in a field near Caravaca, in Murcia.

Investigation has proved that the death of the balloonist was due to asphyxiation, the provision of oxygen only having been calculated for three hours over the 5,000 metres line, whereas the balloon remained over the altitude for four hours.

It is reckoned that the balloon took two hours and ten minutes to rise from 5,000 to 11,000 metres—the maximum altitude reached. It is supposed that it was while Commandante Molas was at this height and endeavouring to rise still further that oxygen failed him and death overtook him; this would account for the balloon remaining above the 5,000 metre point for a further one hour and forty minutes and only descending when the cool of the evening affected the hydrogen, by which time Commandante Molas must have been dead five hours.

The former record Spanish altitude was 6,000 metres.

UNITED STATES.

MOTOR BALLOON.—A new type of airship called the "Motor Balloon" has made its appearance. It was constructed by the Meadowcraft Balloon and Airship Company, and is intended for commercial purposes such as advertising, photography, etc.

The airship is non-rigid, has an overall length of 70 feet, maximum diameter of 30 feet, and a capacity of 22,000 cubic feet. With a 22 h.p. Henderson motor cycle engine a speed of 20 m.p.h. is said to have been attained during test flights. The empty weight is 800 lb. and the useful load is 500 lb.

The unique features lie in the pear-shaped main bag and the subsidiary bag attached to the rear. This small bag forms the control element, being moved up or down as an elevator or to either side as a rudder. The control lines extend between the small bag and the altitude-wheel and rudder-bar in the control car, which hangs beneath the main bag and can accommodate a crew of two. The ship is easily portable, can be set up in an open field, and can be inflated without an inflation net, the load lines serving for the latter purpose. It is easily manoeuvred on the ground, the construction allowing high clearance which is necessary during periods of yaw and pitch.

Test flights were carried out by the U.S. Army Air Corps at Wright Field during the summer of 1928, and these, while demonstrating that the motor balloon is still in the experimental stage, more than proved its possible value for military purposes. One of the outstanding features is the low cost, which is understood to be approximately £1,000. Four or five of these airships filled with Helium gas could be used for the elementary training of airship pilots at about the same initial cost as one standard training airship.

THE "LOS ANGELES."—The airship "Los Angeles" has recently completed a flight of forty hours from Lakehurst to St. Joseph's Bay, Florida, where she moored to the mast in the "Patoka." During the flight adverse winds and heavy fogs were encountered.

REVIEWS OF BOOKS

NAVAL.

Jane's Fighting Ships, 1928. Edited by Oscar Parkes, O.B.E., M.B., Ch.B., and Francis E. McMurtrie, A.I.N.A. (Sampson, Low, Marston & Co., Ltd., London.) £2 2s.

A number of interesting additions enhance the value of the 1928 edition of this most useful publication. The eyes of all those concerned with naval affairs are at present focused, to a large extent, on the cruiser problem. This Annual provides very useful information about most of the new 10,000-ton classes. Extra details are given of the British ships; there is one of Dr. Parks' admirable drawings of the U.S.S. "Pensacola"; another of the Japanese "Nachi"; while recent photographs illustrate the new French and Italian cruisers. Our "London" and "Kents" may have merits which are not very apparent, but they certainly do not compare well on the more obvious points with foreign designs.

Details of the new 10,000-ton German warship were mostly lacking when this book went to press, but a remark in the Preface and a prophetic drawing in a recent copy of *The Illustrated London News*, show that the editors are on the alert as regards a design which is likely to "give furiously to think" (*vide* NAVAL NOTES in this JOURNAL).

Justice is done to the new aircraft carriers, "Courageous" and "Saratoga" by new and clear photographs. Other notable features are the profile drawings of the altered "Queen Elizabeths" and a photograph of the large new U.S. submarine "V-4." The improved type of silhouettes has now been extended to the ships of the United States, Japanese and German Navies. Altogether, the Editors are to be congratulated on keeping up to their own high standard in former years—no light task.

MILITARY.

The German Official History of the War. Vol. 5. Der Weltkrieg 1914 bis 1918. Fünfter Band. Der Herbst-Feldzug 1914. Im Westen bis zum Stellungskrieg. Im Osten bis zum Rückzug. (Berlin, Mittler, 34 marks).

The previous four volumes of the German Official History dealt with the operations in the Eastern and Western theatres in separate volumes, bringing the narrative in both up to the 14th September, 1914, the date of our halt on the river Aisne in France, and of the end of the advance after the battle of the Masurian Lakes in East Prussia. The new volume carries the story on to the 4th November, 1914, in both theatres, in two separate parts. The preface states that "after the simultaneous mishaps on the Marne and in Galicia about the middle of

September, the close interconnection between West and East becomes so marked, that the procedure hitherto adopted of describing the operations in both theatres of war for limited periods in separate volumes must be abandoned, in order to make quite clear the great interdependence of action on the several fronts and, in particular, the critical tensions of the situation as a whole which such a war brought about. The views and decisions of the Supreme Command, so far as the general conduct of the war is concerned, are therefore dealt with separately from the action in the different theatres."

The volume includes the attempt of the Germans to recover the initiative after the battle of the Marne, the "Race to the Sea" and the fighting in Flanders in October and early November, the advance on, and retirement from, Warsaw, and the fighting in East Prussia until the retirement to the Lötzen-Angerapp position.

Why the date of the 4th November, 1914, is selected for closing the volume and bringing the first battle of Ypres to an end is not apparent; for the final decision fell a week later, on 11th November, with the repulse and defeat of the Prussian Guard and Prussian III Corps. As the battle of Ypres, 1914, has already been fully described in a special official monograph (translated into English as "Ypres, 1914"), the omission of the last scene is all the more curious, and is not covered by the general explanation that, in view of the immense extent of the war, the account of the operations must be shorter than in previous volumes.

The compilers sum up dead against General von Falkenhayn, who, as Chief of the General Staff, conducted the strategy of the war. They condemn his attempt to recover the initiative after the battle of the Marne by a renewed offensive. The Seventh Army brought round from Alsace to make a decisive enveloping attack on the Western flank had to be used to stop the gap in the front between Kluck's and Bülow's Armies, opposite the right of the British and the left of the French. The difficulties of moving troops from the left and centre in France to the right in the Race to the Sea are shown by special tables, and attention is properly drawn to the danger threatening the right flank and rear of the Germans whilst Antwerp, Lille and Amiens were in enemy hands. The compilers consider that if the out-flanking manoeuvre had been begun directly the Aisne was reached, instead of merely renewing frontal fights, it would have been successful. They overlook the action of the French and British which left the German commander no choice.

The decision to employ the new Reserve Corps, largely formed of the young men of the 1914 Class—the so-called war volunteers—is most severely condemned: "Not only was the last reserve available at the time expended prematurely, but valuable man-power, irreplaceable material out of which officers could have been made, was led against the enemy in a state of training and combination that was far behind the standard hitherto held necessary in the German Army as regards war-readiness of fighting troops."

Some round figures are given for the losses in the Flanders offensive, with a footnote to the effect that "regular and exact reports during the period are only available for a part of the troops; for the rest, the casualties for a longer or shorter period only are known." The totals "from the middle of October to about the beginning of November (thus excluding the heavy losses of 10th/11th November), for the Fourth Army are 39,000 killed and wounded and 13,000 missing; for the Sixth Army, 27,000 dead and wounded (in Fabeck's group alone, 17,250) and about 1,000 missing; total for the two Armies, 90,000." These figures, as they stand, are useless for purposes of comparison, as numerous wounded treated in corps

area hospitals are not included; but as Mr. Winston Churchill in "The World Crisis" had shown that, over the whole period of the war, German dead to wounded had the proportion of 1 to 2½, the killed in Flanders would be over 20,000. According to the British Official History, the British killed, for the longer period, of the 14th October to the 30th November, amounted to 7,305; the French, who had a slightly larger number of divisions engaged in Flanders against the German Fourth and Sixth Armies, but for many fewer days fighting, had certainly fewer death casualties than the British, so that after allowing for them and for all the Belgian, it seems evident that the Flanders offensive cost the Germans more lives than it did the Allies.

Turning to the Russian front: the compilers consider great opportunities were missed. After the battle of the Masurian Lakes and the successes in Galicia in October, when Hindenburg had gone there and had retrieved the Austrian fortunes, definite victory, they think, was possible, if reinforcements had been sent; whereas it was not in sight in the West. Falkenhayn was satisfied with driving the enemy out of Prussian territory and stabilizing the Austrian front; but he neither stopped the new offensive nor gave sufficient troops to make it effective. Even the forces there present were not used to best advantage; for the Austrians, Hindenburg and François, commanding in East Prussia, acted independently, without a united command. Falkenhayn's decision to continue the offensive in the West was, it is considered, disastrous.

The book which contains 643 pages, is far from easy reading, and exhibits more special pleading than true military historical method. Its inner purpose would seem to be to show the German people how near they were to victory, and how it was the Supreme Command rather than the army that failed. The thirty-two maps and sketches are better and clearer than those issued with previous volumes, and greatly aid the understanding of the text.

Historical and Military Essays. By the Hon. Sir John Fortescue, LL.D., D.Litt. (Macmillan & Co., Ltd., London, 1928.) 10s. 6d. net.

More than half the pages are taken up by a series of essays dealing with the character and activities of King George III. They are based entirely on the private correspondence of that monarch, which was discovered in Windsor Castle some years ago. Sir John Fortescue thereupon edited the entire letters and published them in six large volumes. The most interesting pages are those dealing with the campaign in Flanders of 1793-94.

The remaining essays in the volume touch upon various subjects. The most interesting of these is that which discusses the origin and duties of the Lords Lieutenant of Counties. It is interesting to see how highly Sir John estimates the value of the work performed by the Lords Lieutenants and their deputies before and during the Great War. Incidentally he bestows high praise on Lord Haldane for his perspicacity in this portion of his Army reforms.

The final essay consists of a series of extracts from a contemporary pamphlet which describes two interviews between Lord Ebrington, Sir John Fortescue's grandfather, and the Emperor Napoleon, when the latter was interned at Elba in 1814. This is interesting.

Nearly the whole of the essays have already appeared in print; but they make light reading, although treating of subjects that are essentially historical

in their contents. It seems doubtful, really, if they were truly worth re-publishing in this form.

REGIMENTAL HISTORIES.

The East Yorkshire Regiment in the Great War, 1914-1918. By Everard Wyrall. (London: Harrison & Sons, Ltd. 1928). 15s.

Mr. Wyrall has some experience of compiling regimental histories and this volume is fully up to the standard previously attained by him. The 1st Battalion, East Yorks Regiment, arrived in France with the 6th Division in the middle of the Battle of the Aisne. The 2nd Battalion arrived from India in January, while the first Territorial and Service battalions followed soon after. The regiment fought in every theatre and in some of the hardest actions of the war up to its close. The tightly packed narrative is well supplemented with good maps. There are also the normal Appendices of regimental interest.

The History of the 1st and 2nd Battalions The Leicestershire Regiment, in the Great War. By Colonel H. C. Wylly, C.B. (Gale & Polden, Ltd., Aldershot).

This regimental history differs from most others of its kind in that it deals only with the achievements of the two regular battalions of the Regiment. The story of each of these is well told within the compass of 100 pages apiece. The 1st Battalion arrived in France with the 6th Division in the middle of the battle of the Aisne and fought with distinction right through to the Armistice. The 2nd Battalion arrived with the Meerut Division from India in October, 1914. At the end of 1916 it was transferred to Mesopotamia, whence it moved to Palestine in January, 1918. The story is brightly written and illustrated with adequate maps.

The Royal Inniskilling Fusiliers. Being the History of the Regiment from December, 1688, to July, 1914. Compiled under the direction of a Regimental Historical Records Committee. (London: Constable & Co., Ltd. 1928).

This work is far more than a normal military history. It is based on real historical research and gives a very complete picture of the earlier existence of the various units that are now assembled under the title of Inniskilling Fusiliers. These are: the old 27th or Inniskilling Regiment of Foot, the Third Madras Europeans (later the 108th Regiment of Foot), and the Militia Regiments of Fermanagh, Tyrone and Donegal. The latter portion contains a clear account of the Fusiliers' work in the South African War. The volume is well illustrated with historical portraits, photographs of badges, buttons and the like. There are some very full appendices.

A Medal Roll of the Queen's Own Royal West Kent Regiment, 50th and 97th Regiments of Foot. Part I: 1793—1881. Published by the Queen's Own Relics Fund as a Supplement to the Queen's Own Gazette. 4s.

This is a detailed nominal roll of every medal and clasp awarded to this Regiment, beginning with the Egyptian Campaign of 1801 and ending with the New Zealand War of 1863-66. A monument of patience which should appeal to the collector of medals.

COMPILATION OF REGIMENTAL HISTORIES.

The attention of the Council of the Royal United Service Institution has been drawn to the fact that Regiments and Corps who are desirous of compiling their histories or records are often in need of advice. The Council therefore desire to make known that the Institution is prepared to render every assistance in the matter, especially on the following points:—

- (1) Suggestions as to an author.
- (2) Selection of printers and publishers.
- (3) The style and size of the book, type and binding.
- (4) The method of illustrating, colour and otherwise, artists, photographers, etc.
- (5) Preparation of list of Officers.
- (6) Where and how research information may be obtained.

AIR

All the World's Aircraft, 1928. Edited by C. G. Grey; Compiled by Leonard Bridgman. (Sampson Low.) 2 Gns. net.

This year's issue of "All the World's Aircraft" has special historical value because its contents show the progress that has been achieved in both commercial and military aviation during the peaceful decade following the war. Study of the historical section and the sections dealing with aeroplanes and aero-engines throws extremely interesting light upon the different lines of development that are being followed in different countries. Mr. C. G. Grey, in the Preface, mentions the low-powered aeroplanes which have shown such remarkable progress in this country and which, as he points out, bear a similar relation to the big-cabin-type American aircraft as the low-powered high-speed English car does to the big-engined American saloon car. But Mr. Grey omits to draw attention to a peculiarly British development of even greater importance, the development of the large all-metal flying boat. Excellent illustrations are included of the Saunders' "Valkyrie," the Short "Singapore" and "Calcutta," the Blackburn "Iris" and the Supermarine "Southampton." These boats are growing in size and increasing in seaworthiness year by year in a manner which makes one wonder if they are not destined to be the real "air liners" of the future.

The descriptive notes accompanying the illustrations show, in this year's edition, a greater uniformity and more conciseness than in former numbers. There appears to be, however, a reduction in the number of line drawings illustrating the layout of the machines. This is regrettable for these drawings enable the military characteristics of service types to be appreciated more readily than the photographs. Fields of fire from the gunners' cockpits, pilot's view, vulnerability to attack from the rear and a host of similar points may be quickly examined in the drawings. But the reduction in the number of the drawings is a small omission in a work which brings together in a convenient form valuable information about aeronautics from all parts of the world. And the book is by no means a dry list of facts and figures; it is one of the most fascinating works on aeronautics for all those who thirst for accurate information lucidly presented. Mr. Grey and Mr. Leonard Bridgman who compile and edit the work are to be congratulated.

The attention of the reader is called to the fact that the book is not a complete guide to the latest developments in aeronautics, but a selection of the most important and interesting information available at the time of publication. It is intended to be a reference work for those who are interested in the subject, and not a book to be read from cover to cover.

- (1) Suggestions as to the author.
- (2) Selection of subjects and illustrations.
- (3) The style and layout of the book, type and binding.
- (4) The method of publishing, price and distribution.
- (5) The method of distribution.
- (6) The method of distribution.
- (7) The method of distribution.
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- (9) The method of distribution.
- (10) The method of distribution.

The book is published by the Royal Aeronautical Society, 11, Bedford Square, London, W.C.1. It is sold by all booksellers and is also available from the Society's Publications Department, 11, Bedford Square, London, W.C.1.

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- THE ROYAL INNISKILLING FUSILIERS FROM DECEMBER, 1688 TO JULY, 1914. Compiled by a Regimental Historical Records Committee. 8vo. (Constable & Co., Ltd., London). Presented by the Colonel and Officers, Royal Inniskilling Fusiliers.

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